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DNA 4628Z

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

The BDM Corporation

7915 Jones Branch Drive

McLean, Virginia 22101

26 May 1978

Interim Report for Period 16 November 1977-26 May 1978

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A major assumption underlying the calculation of casualties from a nuclear exchange concerns the time civilian populations can be expected to stay in fallout shelters. Presently, two general guidelines are used: 1) one week of shelter stay followed by two weeks of partial shelter occupancy and, 2) a two day shelter stay followed by three days of partial shelter occupancy.			

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20. ABSTRACT (Continued)

The objective of this program is to explore the nature of these assumptions using behavioral sciences data.

Systematic quantitative estimates of shelter stay times can be obtained from an empirical data base. Length of shelter stay is dependent on a variety of variables the most important being degree of preparedness. Generally, post attack behavior will be the range considered normal. The use of quantitative estimates of fallout shelter stay time reduces the variability associated with predicting the human factor in strategic simulations.

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BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

ADDITIONAL 127

STATE SECTION

DATE

TIME

NOT

BY

REASON FOR AVAILABILITY CHANGES

AVAIL. CHG. OR SPECIAL

REMARKS

Behavioral Aspects of Fallout Shelter Stay

Summary

Objective

A major assumption underlying the calculation of casualties from a nuclear exchange concerns the time civilian populations can be expected to stay in fallout shelters. Presently, two general guidelines are used: 1) one week of shelter stay followed by two weeks of partial shelter occupancy and, 2) a two day shelter stay followed by three days of partial shelter occupancy.

The objective of this program is to explore the nature of these assumptions using behavioral sciences data.

Approach and Method

Behavioral studies of fallout shelter occupancy, human response to disasters and isolation/confinement studies were systematically surveyed for quantitative estimates of time spent in shelters and qualitative data bearing on the behavioral profile of shelterers. Three thousand estimates were derived from approximately seven hundred studies. Eight general categories of data were identified: 1) physiological, 2) shelter space, 3) shelter type, 4) warning, 5) training, 6) shelter management, 7) evacuation posture and 8) communication. For each of these categories, estimates of propensity for attrition (a quantitative measure of expected shelter stay time) were derived as a function of time since sheltering. Results were refined by eliminating data from incidents not analogous to a post attack environment. Qualitative behavior profiles derived from questionnaires, interviews and observations were developed and used to interpret the quantitative data.

Major Findings

Systematic quantitative estimates of shelter stay times can be obtained from an empirical database. Length of shelter stay is dependent on a variety of variables the most important being degree of preparedness. Generally, post attack behavior will be in the range considered normal. The use of quantitative estimates of fallout shelter stay time reduces the variability associated with predicting the human factor in strategic simulations.

Application to Post Attack Environments (PAE) and Soviet Populations

The results of this study are based on data collected in an American environment under conditions similar to a PAE, but by no means fully capture, what such an environment might be like. However, there is a good reason to believe that the human response to disaster is applicable to the post attack environment. The elements of the process of coping with disaster are so similar across time and culture, that it would not be parsimonious to believe that the post attack environment would spawn a completely different type of behavior.

The application of program data to Soviet populations is a major study limitation. One way of contrasting Soviet preparation with that of the United States is to compare best and worst cases for the study variables.

The current controversy over the degree of Soviet preparedness has not been resolved to the point where a single position can be used to interpret stay time estimates. We can say however, that if the Soviets are better prepared than we, than their expected stay times might be similar to the times of the prepared groups represented by the database presented here.

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

BRIEFING OUTLINE

- 1. OBJECTIVES**
- 2. APPROACH**
- 3. SCENARIO**
- 4. DEFINITIONS**
- 5. DATA SUMMARY**
- 6. MAJOR FINDINGS**
- 7. USAGE**
- 8. VARIABLES**
- 9. CRITERIA**
- 10. SOURCES**
- 11. SHELTER STAY TIME CURVES**

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

OBJECTIVES

1. TO EXPLORE THE ASSUMPTIONS UNDERLYING
ESTIMATES OF FALLOUT SHELTER STAY TIMES
2. TO EXPLORE THE POTENTIAL EFFECTS OF
BEHAVIORAL SCIENCE DATA ON THESE
ESTIMATES

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

APPROACH

1. IDENTIFICATION OF PERTINENT DATA
2. CLUSTER ANALYSIS FOR IDENTIFICATION OF
QUANTIZED CRITICAL VARIABLES
3. COMPILATION OF PILOT DATA
4. REANALYSIS OF DATA
5. APPLICATION OF CRITERIA
6. REANALYSIS OF DATA
7. DATA REDUCTION AND CURVE FITTING

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

SCENARIO

- ONE MONTH OF INCREASING INTERNATIONAL TENSION
- TWO-THREE DAYS OF CRITICAL INCIDENTS
- MIXED COUNTERFORCE/COUNTERVALUE STRATEGY
- EXCHANGE COMPLETED WITHIN 24 HOURS.

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

DEFINITIONS

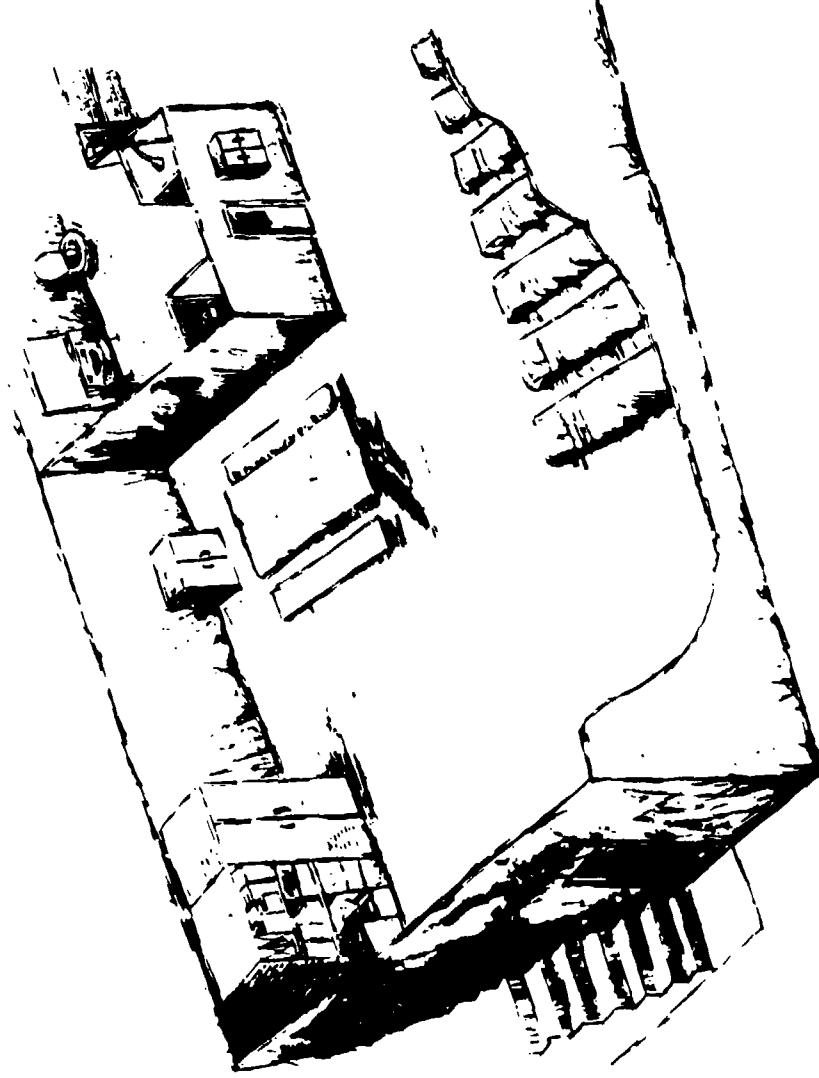
- **SHELTERING.**
AN OVERT BEHAVIOR WHOSE OBJECTIVE IS TO PARTIALLY OR COMPLETELY PROTECT THE INDIVIDUAL FROM THE PHYSICAL EFFECTS OF AN INCIDENT.
- **PROPENSITY FOR ATTRITION.**
AN EXPECTED VALUE, EXPRESSED AS A PERCENTAGE EXTRAPOLATED FROM EMPIRICAL DATA, INDICATING TENDENCIES TO LEAVE SHELTER.

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

PREATTACK

BEHAVIORAL PROFILE

- **AWARE**
- **CONCERNED**
- **UNFOCUSED ACTIONS**

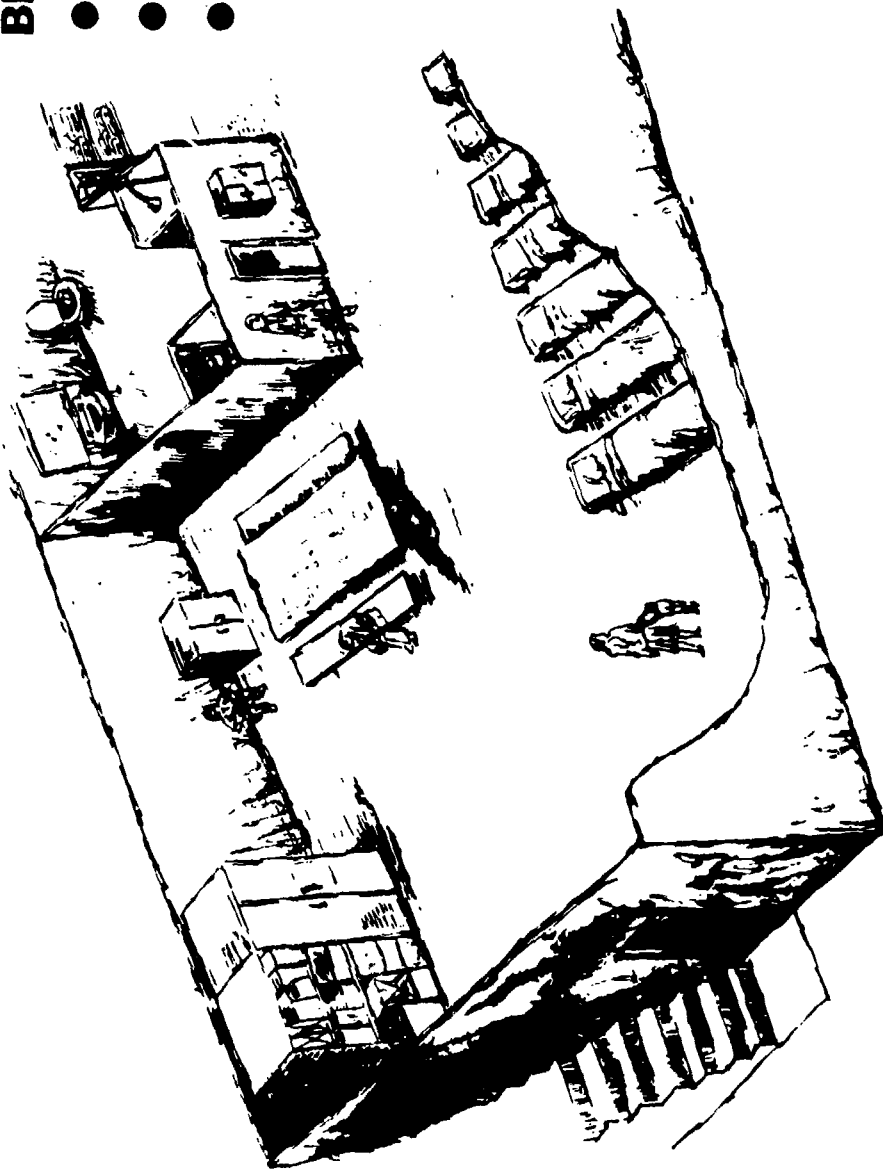


BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

ATTACK

BEHAVIORAL PROFILE

- DAZED
- MUTED
- STEREOTYPICAL

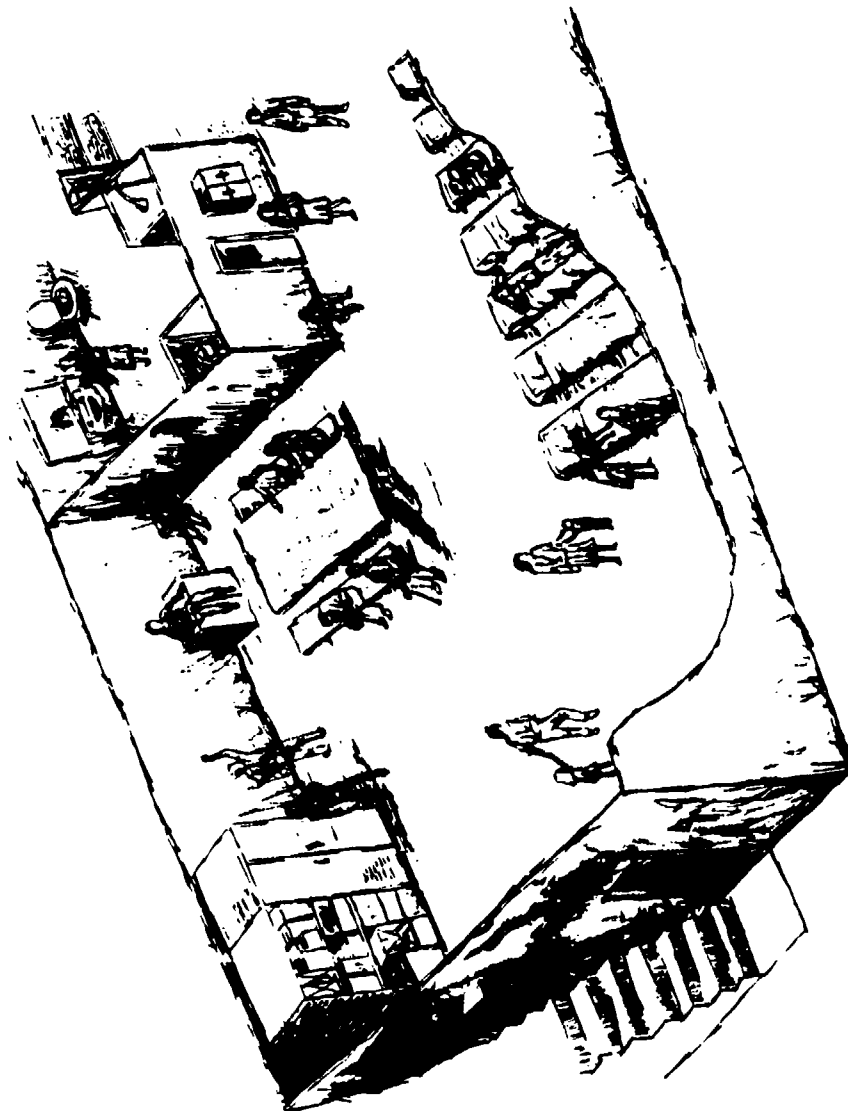


**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**24 HOURS
DAY 1**

BEHAVIORAL PROFILE

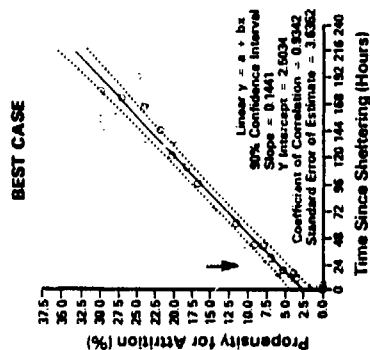
- FUZZY
- ANGER/FRUSTRATION
- RIGIDITY



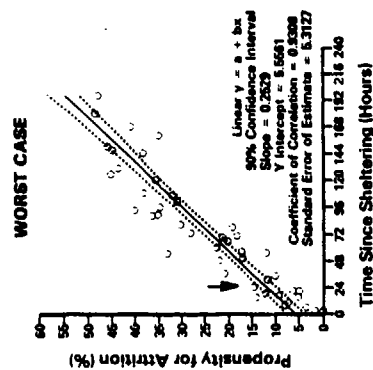
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BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

24 HOURS DAY 1



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Δ CUM
11.6

REASONS FOR LEAVING

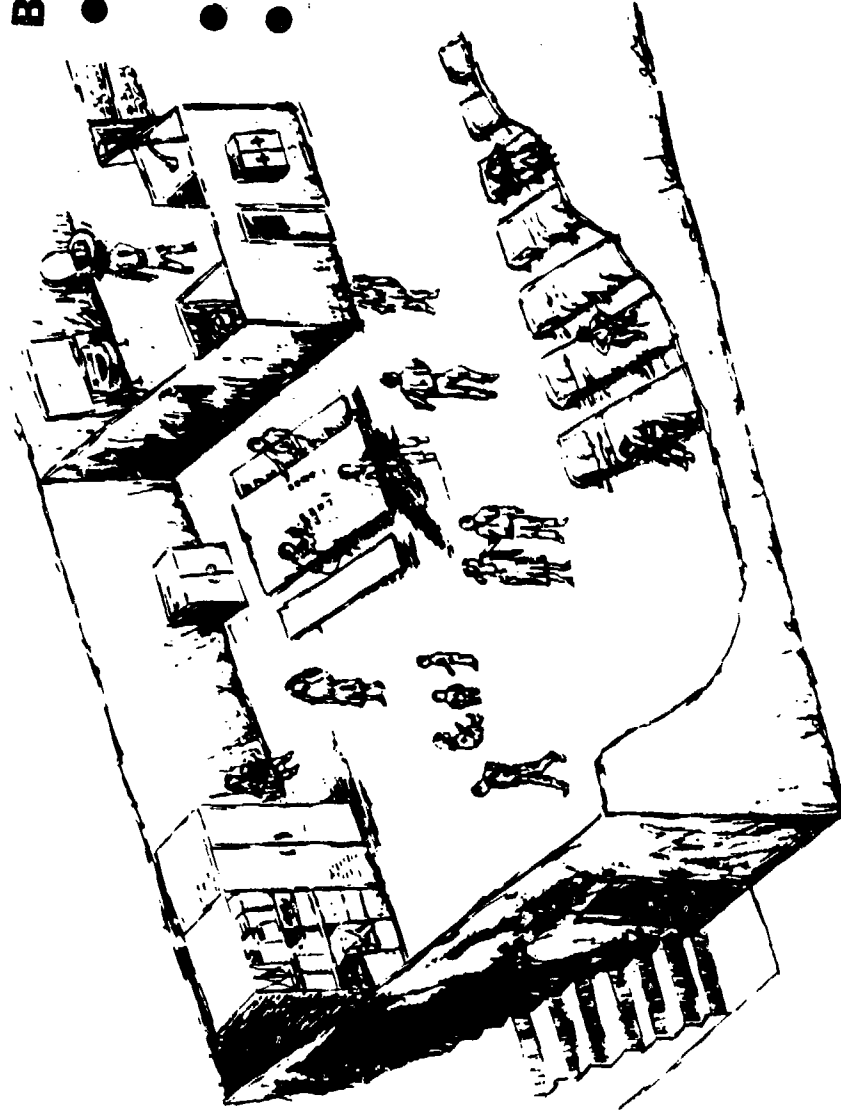
- PHYSICAL EFFECTS
- LACK OF COMMUNICATION
- LACK OF DIRECTION

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

**48 HOURS
DAY 2**

BEHAVIORAL PROFILE

- DIFFICULTY SOLVING PROBLEMS
- FEAR/ANXIETY
- MANIFESTATIONS OF BOREDOM

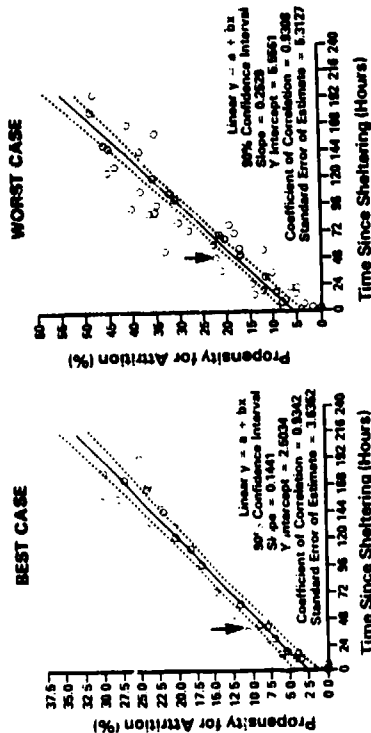


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BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

48 HOURS
DAY 2

- REASONS FOR LEAVING**
- **PHYSICAL EFFECTS**
 - **PHYSIOLOGICAL NEEDS**
 - **LACK OF COMMUNICATION**
 - **LACK OF DIRECTION**
 - **PRIMARY GROUP SEPARATION**

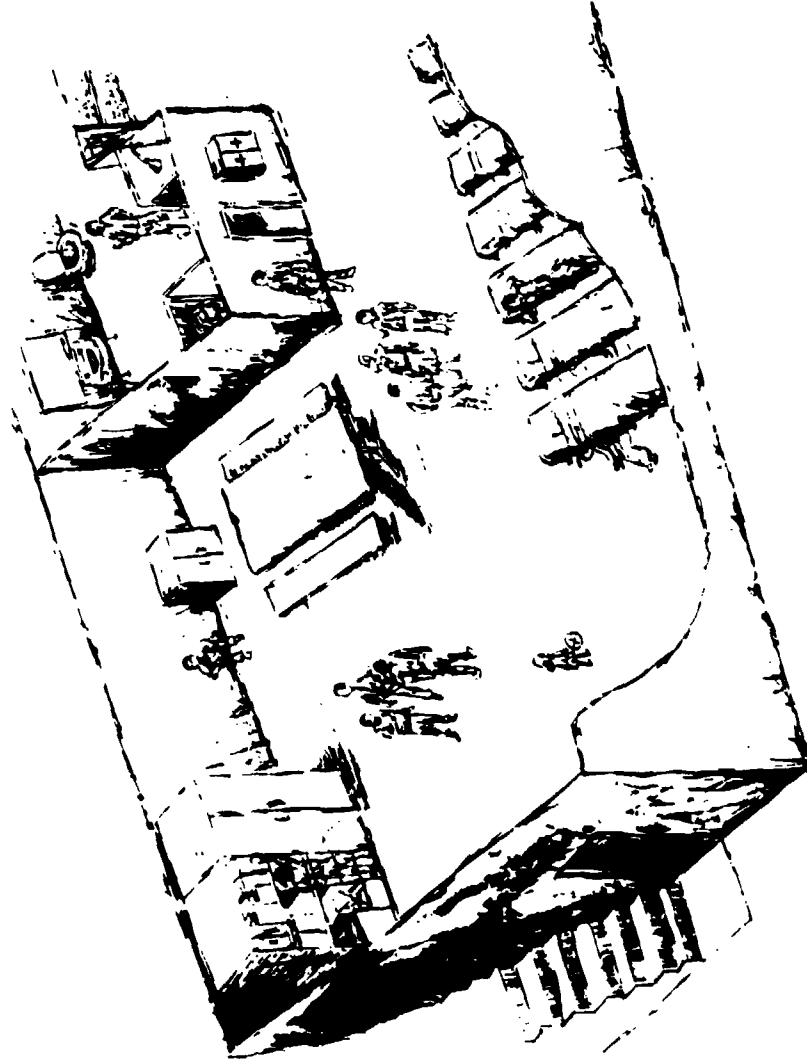


Δ CUM Δ CUM
3.5 9.4 6.1 17.7

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**72 HOURS
DAY 3**

- BEHAVIORAL PROFILE**
- *COGNITIVE CLEARING*
 - **ANXIETY REDUCTION**
 - **TENSION REDUCTION**

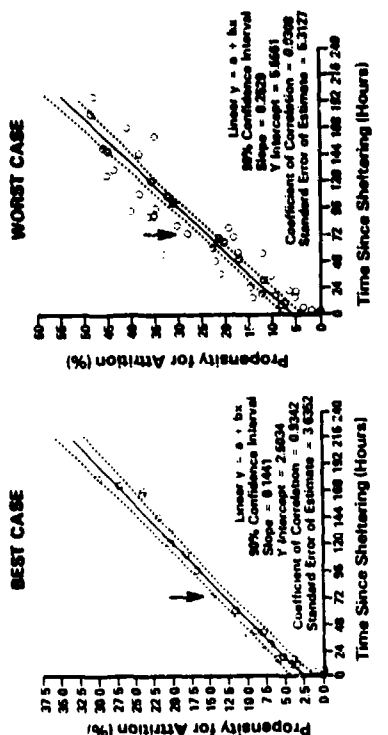


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BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

72 HOURS DAY 3

- ### REASONS FOR LEAVING
- PHYSIOLOGICAL NEEDS
 - PRIMARY GROUP SEPARATION
 - NEED FOR ACTION



Δ CUM
3.5 12.9

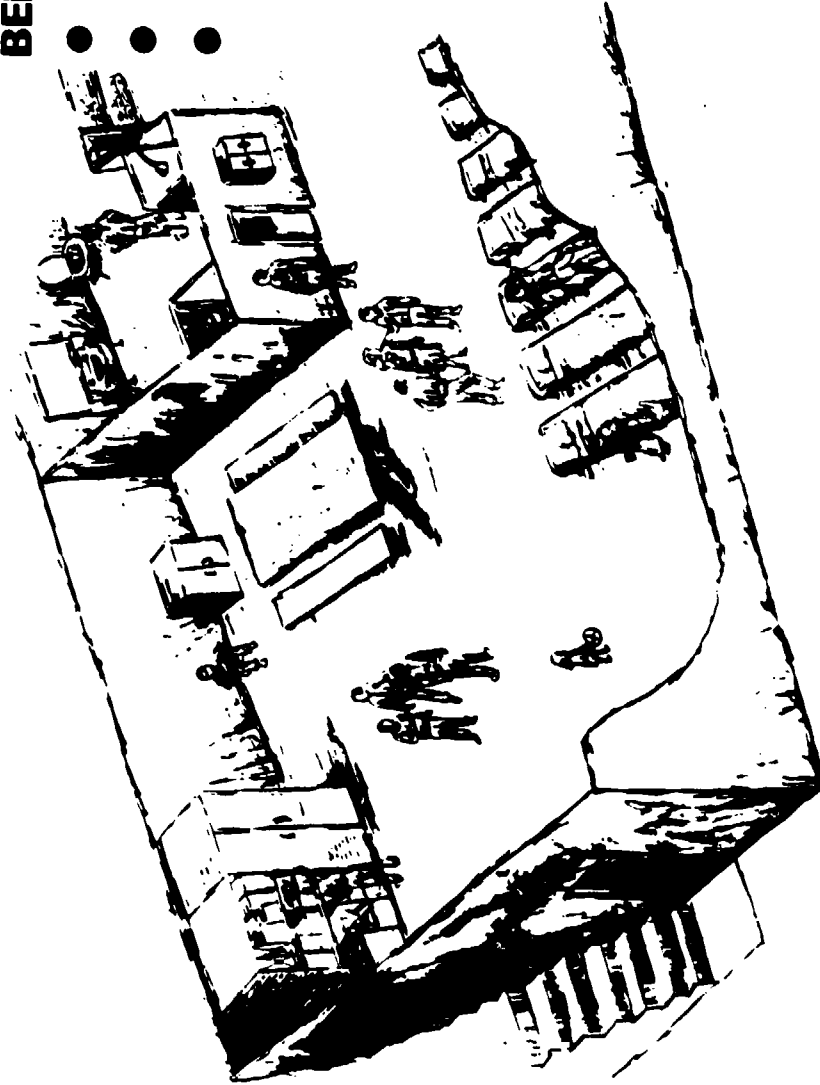
Δ CUM
6.1 23.8

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**96 HOURS
DAY 4**

BEHAVIORAL PROFILE

- **NORMAL**
- **TENSION/IRRITABILITY**
- **REACTIONS TO FORCED IDLENESS**

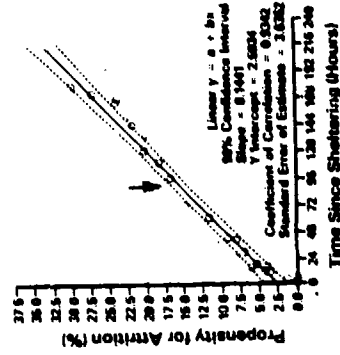


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BEHAVIORAL ASPECTS OF FALLOUT SHELTER STUDY

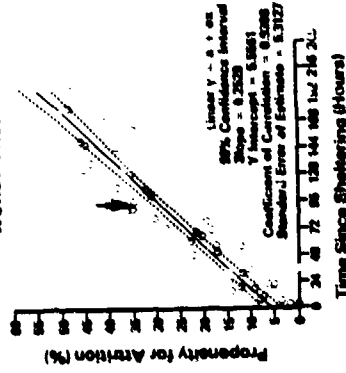
96 HOURS
DAY 4

BEST CASE



Δ 4.3 CUM 16.3

WORST CASE



Δ 6.0 CUM 29.8

REASONS FOR LEAVING

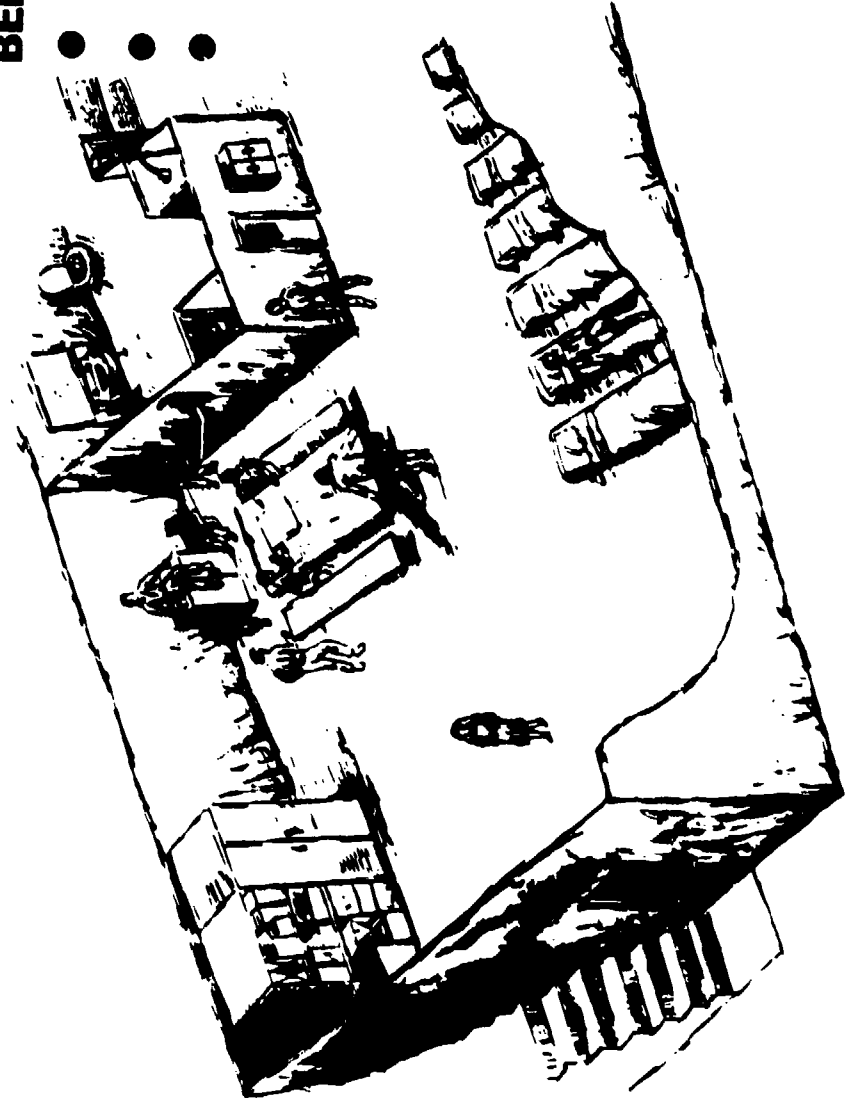
- NEED TO BE DOING SOMETHING
- JUDGEMENT THAT DANGER WAS PASSED
- ORGANIZED ACTIVITY

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**120 HOURS
DAY 5**

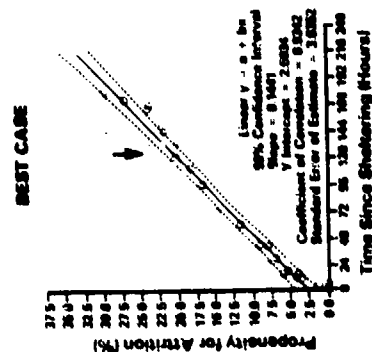
BEHAVIORAL PROFILE

- **NORMAL**
- *IRRITABILITY*
- **ORGANIZED ACTIVITY**

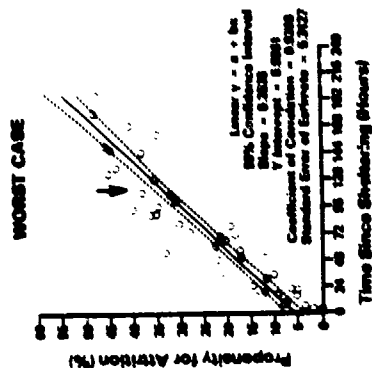


BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

120 HOURS
DAY 5



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3.5 19.8

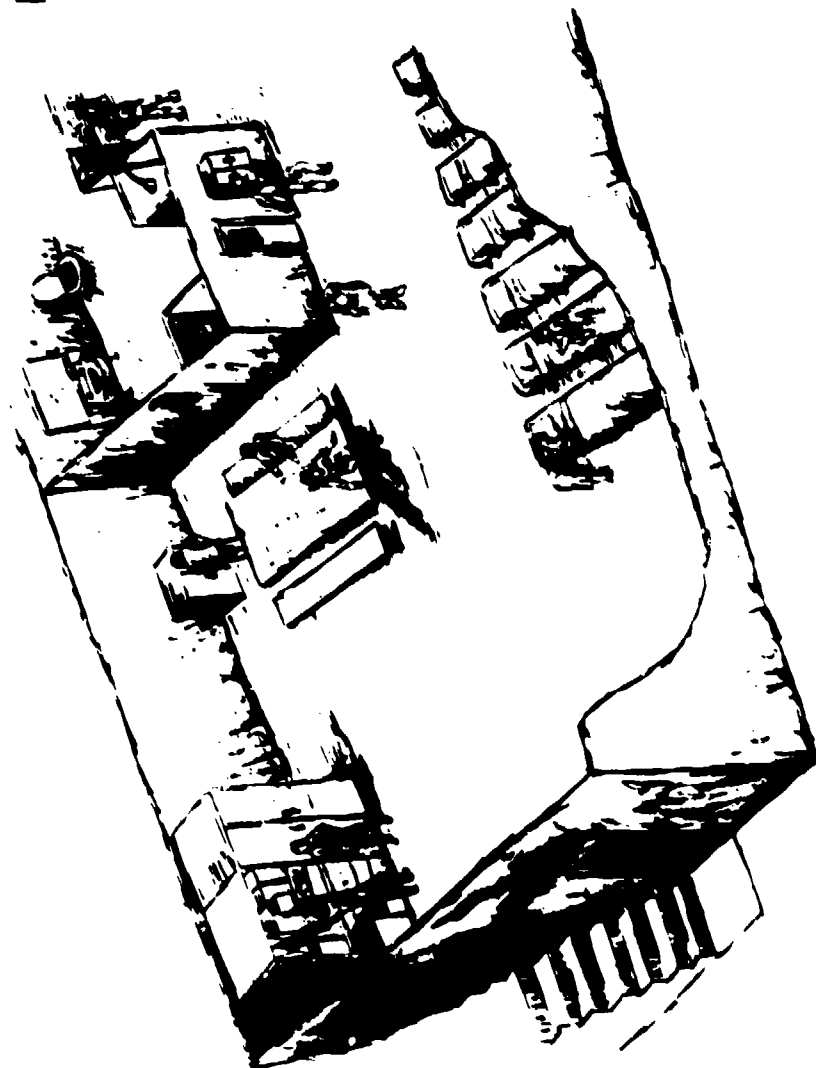


Δ CUM
6.1 35.9

- REASONS FOR LEAVING**
- LACK OF COMMUNICATION
 - INDEPENDENT JUDGEMENT
 - PRIMARY GROUP CONCERN
 - PHYSIOLOGICAL NEEDS

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**144 HOURS
DAY 6**



BEHAVIORAL PROFILE

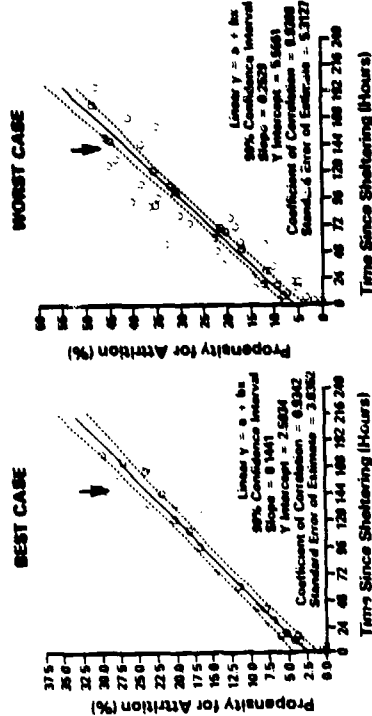
- **NORMAL**
- **ACCEPTANCE**
- **DIFFERENTIATION OF ACTIVITIES**

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BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

144 HOURS
DAY 6

- REASONS FOR LEAVING**
- EXPLORATION OF ENVIRONMENT
 - PRIMARY GROUP CONCERN
 - EXHAUSTION OF RESOURCES
 - RESCUE EFFORTS



Δ CUM Δ CUM

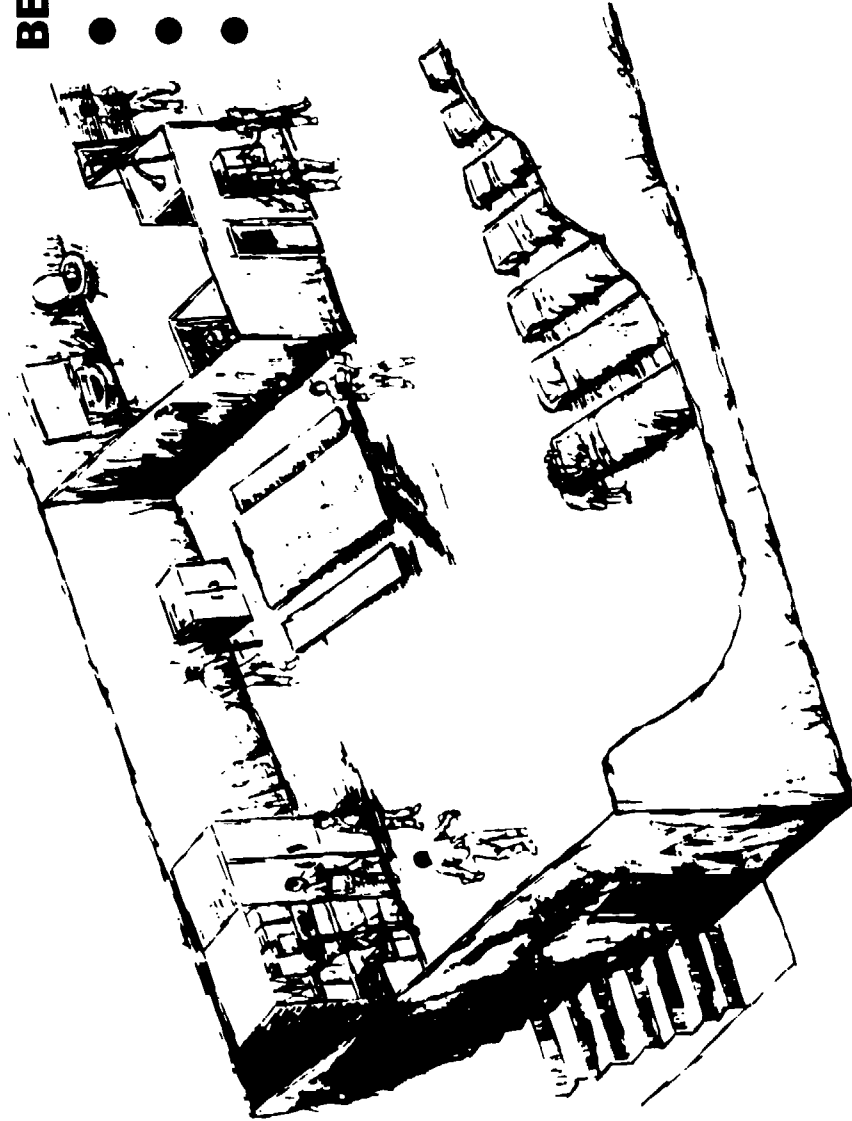
3.4 23.2 6.1 42.0

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**168 HOURS
DAY 7**

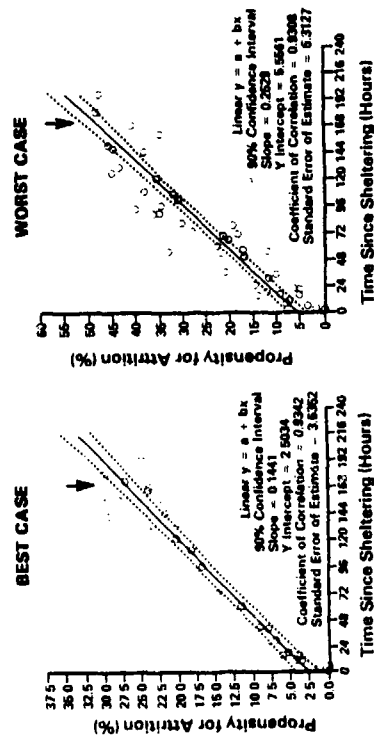
BEHAVIORAL PROFILE

- **NORMAL**
- **NORMAL**
- **DIRECTED ORGANIZED
ACTIVITIES**



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

168 HOURS
DAY 7



Δ 3.5 CUM 26.7

Δ 6.0 CUM 48.0

- REASONS FOR LEAVING**
- PERCEPTION OF DANGER OVER
 - NEED FOR ACTION
 - RE-ESTABLISH COMMUNITY
 - EXHAUSTION OF PHYSICAL RESOURCES

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

MAJOR FINDINGS

- **QUANTITATIVE ESTIMATES OF FALLOUT SHELTER POPULATIONS CAN BE OBTAINED**
- **LENGTH OF FALLOUT SHELTER STAY IS DEPENDENT ON A VARIETY OF VARIABLES**
- **THE MOST SENSITIVE OF THESE VARIABLES IS DEGREE OF PREPAREDNESS. ($\Delta = 22\%$)**
- **POST ATTACK BEHAVIOR WILL BE WITHIN THE RANGE CONSIDERED "NORMAL"**
- **APPLICATION TO SOVIET POPULATIONS SHOULD, MOST REASONABLY, BE IN TERMS OF BEST AND WORST CASES**
- **THE RESULTS OF THIS ANALYSIS APPEAR TO INCREASE THE CREDIBILITY OF CURRENT FALLOUT SHELTER STAY TIME ESTIMATES.**
- **A BEHAVIORAL ANALYSIS ADDS A MEANINGFUL DIMENSION TO STUDIES OF FALLOUT SHELTER STAY TIMES.**

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**APPLICATION TO
SOVIET POPULATIONS**

- **DATA GENERALIZES ACROSS CULTURE AND TIME.**
- **SOVIET POPULATIONS ARE PROBABLY BETTER PREPARED THAN THEIR AMERICAN COUNTERPARTS.**
- **SOVIET POPULATIONS ARE PROBABLY NOT AS PREPARED AS THEIR LITERATURE INDICATES.**
- **IN THE ABSENCE OF DEFINITIVE INFORMATION, A COMPARISON OF BEST AND WORST CASES IS REASONABLE.**

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

USAGE

POPULATION
AT
RISK
100

%
WARNED
60

%
SHELTERING
15

LENGTH OF
SHELTER
STAY
(ESTIMATES)

FURTHER
CALCULATIONS

Example:

TBILISI, SOVIET GEORGIA

1,100,000

600,000

150,000

ATTRITION EQUATIONS

BEST

$$y = 0.14x + 2.5$$

WORST

$$y = 0.25x + 5.6$$

POPULATION REMAINING IN SHELTERS

CASE	24 HRS	48 HRS	72 HRS	96 HRS	120 HRS	144 HRS	168 HRS
BEST	141,000	136,000	130,000	125,000	120,000	115,000	110,000
WORST	133,000	123,000	114,000	105,000	96,000	87,000	78,000

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**WHAT WE
CAN KNOW**

- **WHAT WE CAN KNOW?**
 - **DISASTER PROFILE**
 - **SIMULATED SHELTER BEHAVIOR**
 - **EXTRAPOLATED QUANTITATIVE DATA**
- **WHAT WE CAN SPECULATE ABOUT?**
 - **APPLICATION TO SOVIET POPULATIONS**
 - **INTERPRETATION**
- **WHAT WE CAN'T KNOW**
 - **WHAT WOULD REALLY HAPPEN?**

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

VARIABLES

- PHYSIOLOGICAL
- SHELTER SPACE
- SHELTER TYPE
- WARNING
- TRAINING
- SHELTER MANAGEMENT
- EVACUATION POSTURE
- COMMUNICATION

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

**SOURCES
DATA TYPE**

SOURCES

- **DISASTER RESEARCH**
- **SHELTER RESEARCH**
- **INTELLIGENCE**

DATA TYPES

- **OBSERVATIONS**
- **INTERVIEWS**
- **QUESTIONNAIRES**

**BEHAVIORAL ASPECTS
OF FALLOUT SHELTER STAY**

CRITERIA

- **BRIEF, INTENSE EXPENDITURE OF ENERGY**
- **BEFORE ARRIVAL OF AID**
- **DATA COLLECTED WITHIN 30 DAYS OF INCIDENT**
- **RELIABLE DATA COLLECTOR**
- **DATA COLLECTED WITHIN IMPACT AND FRINGE AREAS**
- **QUANTITATIVE DATA AVAILABLE**

**BEHAVIORAL ASPECTS
OF FAILOUT SHELTER STAY**

SOURCES

<u>SOURCE</u>	<u>NUMBER OF STUDIES</u>	<u>PERCENTAGE OF DATA</u>
● NAS/NRC/NORC	350	35
● DCPA	83	30
● OHIO STATE/DRC	200	20
● MISCELLANEOUS	45	15

SOURCES DISASTER RESEARCH

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

<u>DISASTER AGENTS</u>	<u>EVENTS STUDIED</u>	<u>FIELD STUDIES</u>	<u>INTERVIEWS AND QUESTIONNAIRES</u>	<u>REPORTS</u>
AIRPLANES	4	3	176	7
BLIZZARDS	3	2	19	2
EARTHQUAKES, ETC.	8	8	1,831	10
EPIDEMICS AND EPIDEMIC THREATS	5	5	2,487	7
EXPLOSIONS AND FIRES	13	13	678	11
FALSE ALERTS	6	7	2,953	7
FLOODS	12	16	3,319	27
HURRICANES AND TYPHOONS	12	9	364	9
MINE DISASTERS	2	3	297	5
TORNADOES	20	31	2,092	34
TOXICOLOGICAL SUBSTANCES	8	8	227	6
WORLD WAR II BOMBINGS	4	6	7,163	4
MISCELLANEOUS	6	3	18	4
TOTALS	103	114	21,624	121
		33		

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

SOURCES/FALLOUT SHELTER RESEARCH

TABLE 1
SUMMARY OF OCCUPANCY STUDIES,
SHELTEREES, AND MAN DAYS OF OCCUPANCY,
BY STUDY DURATION

DURATION OF STUDIES	NUMBER OF STUDIES	NUMBER OF SHELTEREES	MAN DAYS OF OCCUPANCY ^(a)
14 DAYS	10	585	8190
8 DAYS	1	38	304
7 DAYS	6	467	3269
6 DAYS	1	144	864
5 DAYS	2	145	725
4 DAYS	2	63	252
3 DAYS	4	152	456
2 DAYS	24	3346	6692
1 DAY	30	1672	1672
12 HOURS	2	494	247
TOTALS	82	7106	22671

^(a) NOT ADJUSTED FOR DEFECTIONS.

TABLE 2
STUDIES BY POPULATION SIZE AND
MAN DAYS OF OCCUPANCY

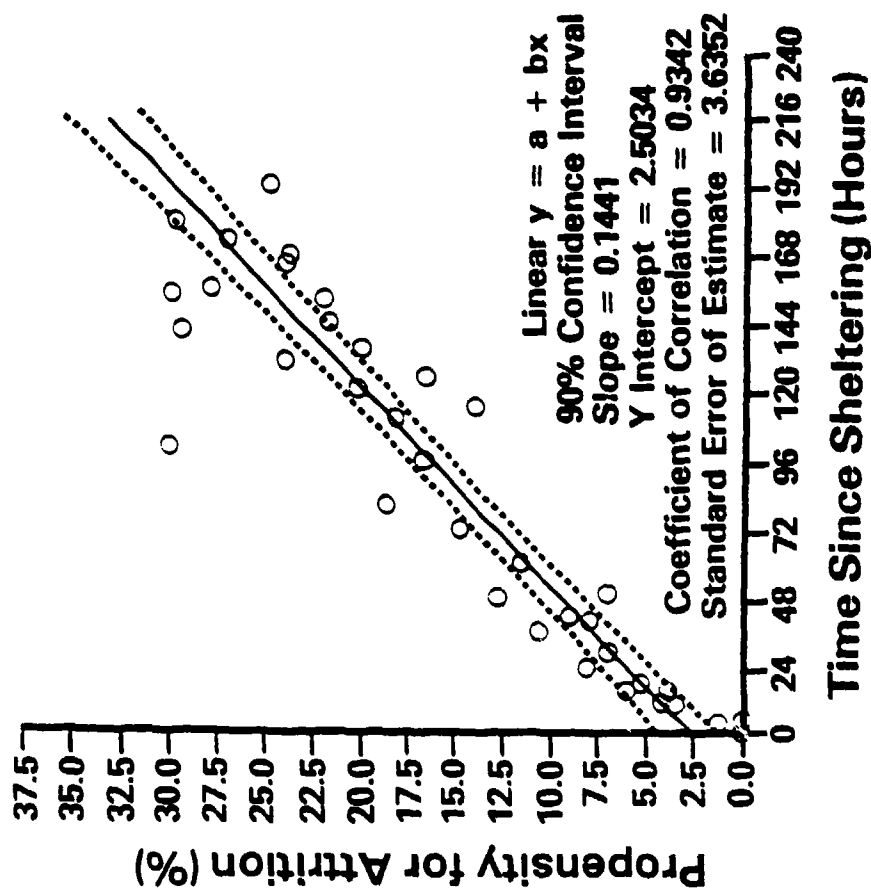
NUMBER OF SHELTEREES IN STUDY	NUMBER OF STUDIES	MAN DAYS OF OCCUPANCY
4, 5, 6, 7, 8, 10	12	198
15, 16, 18, 19, 20	12	213
21, 23, 24, 25, 26, 27	11	422
30, 34	14	2896
38, 40, 45, 51	13	1680
80	2	2240
99, 100, 104	7	5150
144, 160	2	1184
300, 307, 321	3	3391
390, 400, 402	3	1799
504	1	1008
722	1	1444
1046	1	1046
TOTALS	82	22671

From: Carr, F. and Garrett, R. State-of-the-Art. Shelter Management Research.
DCPA Report 23, October 1976.

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

BEST CASE	TIME (HOURS)	PROPENSITY (%)
	24	6.0
	48	9.4
	72	12.9
	96	16.3
	120	19.8
	144	23.2
	168	26.7
	192	30.2
	216	33.6
	240	37.1

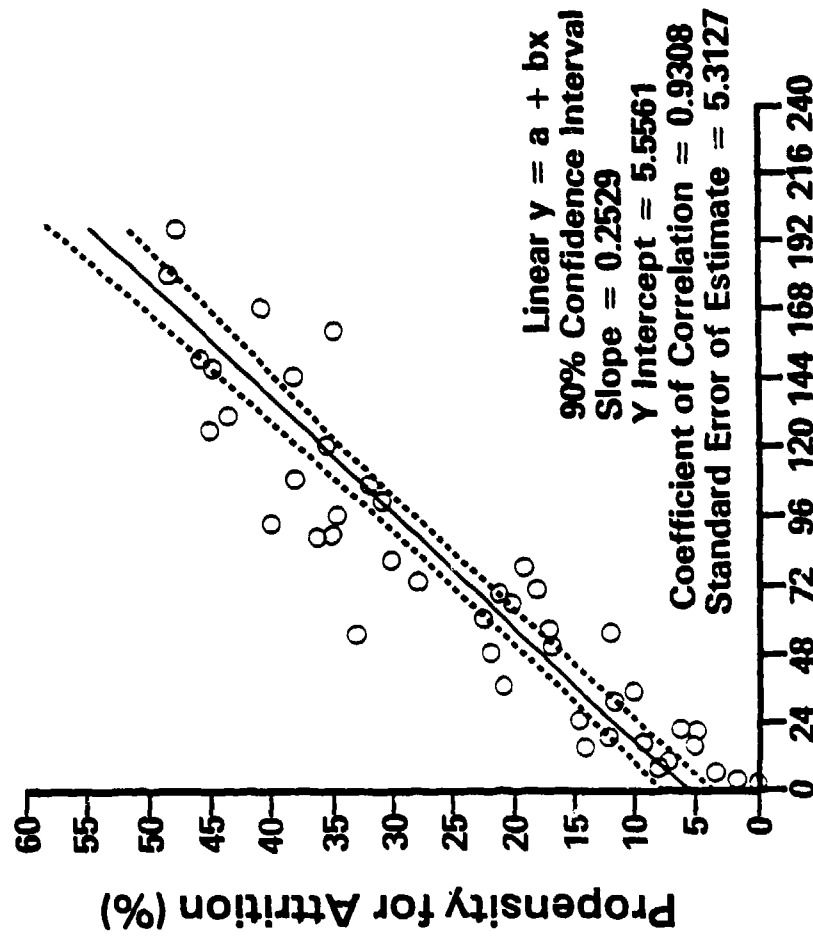


BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

TIME (HOURS)	PROPENSITY (%)
24	11.6
48	17.7
72	23.8
96	30.0
120	36.0
144	42.0
168	48.0
192	54.1
216	60.2
240	66.2

WORST CASE

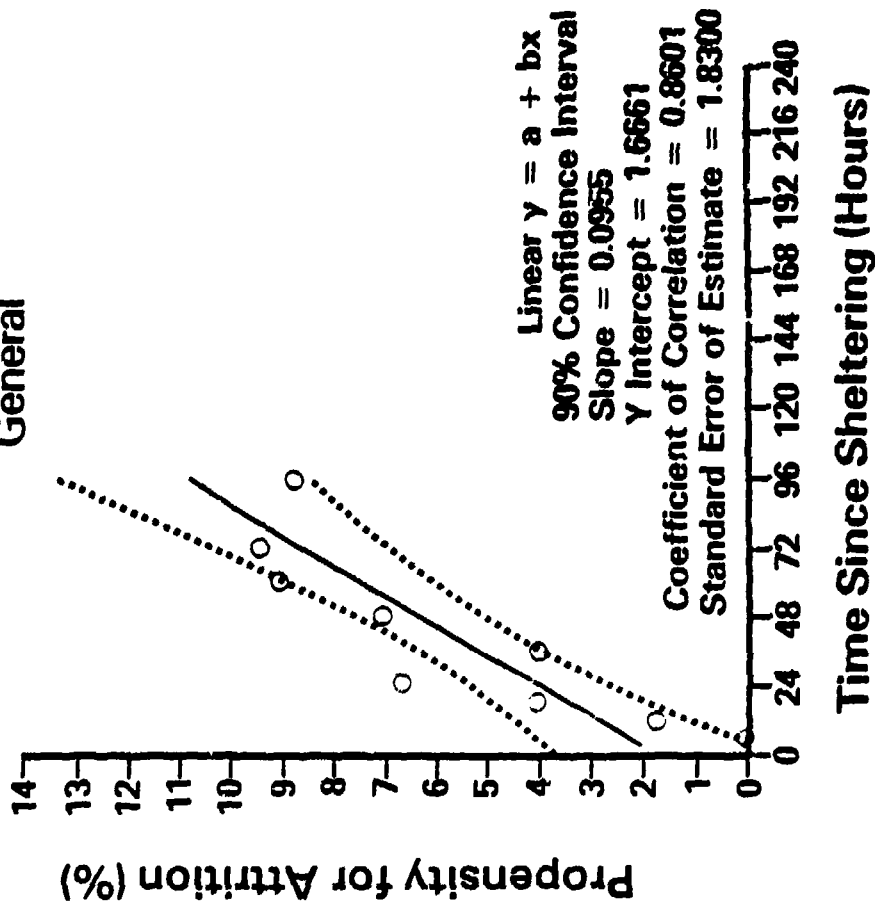


Time Since Sheltering (Hours)

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

BASIC PHYSIOLOGICAL Food Availability General	TIME (HOURS)	PROPENSITY (%)
	24	4.0
	48	6.3
	72	8.5
	96	10.8
	120	13.1
	144	15.4
	168	17.7
	192	20.0
	216	22.3
	240	24.6



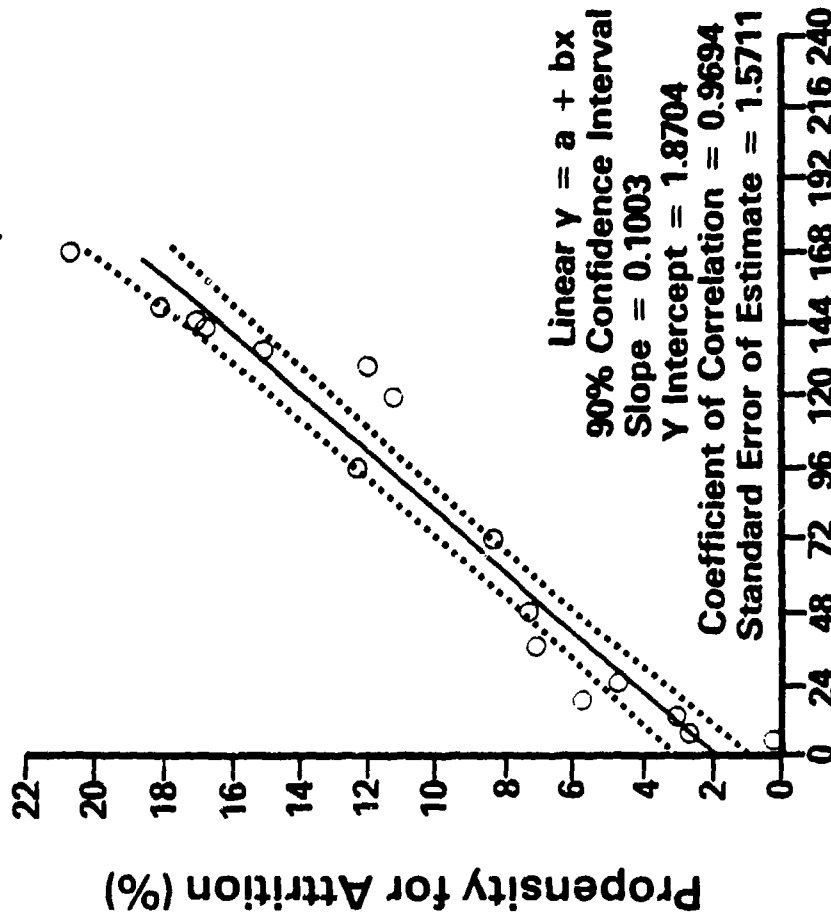
BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

BASIC PHYSIOLOGICAL
Food Availability
1000 Cal./Day

TIME
(HOURS)

PROPENSITY
(%)

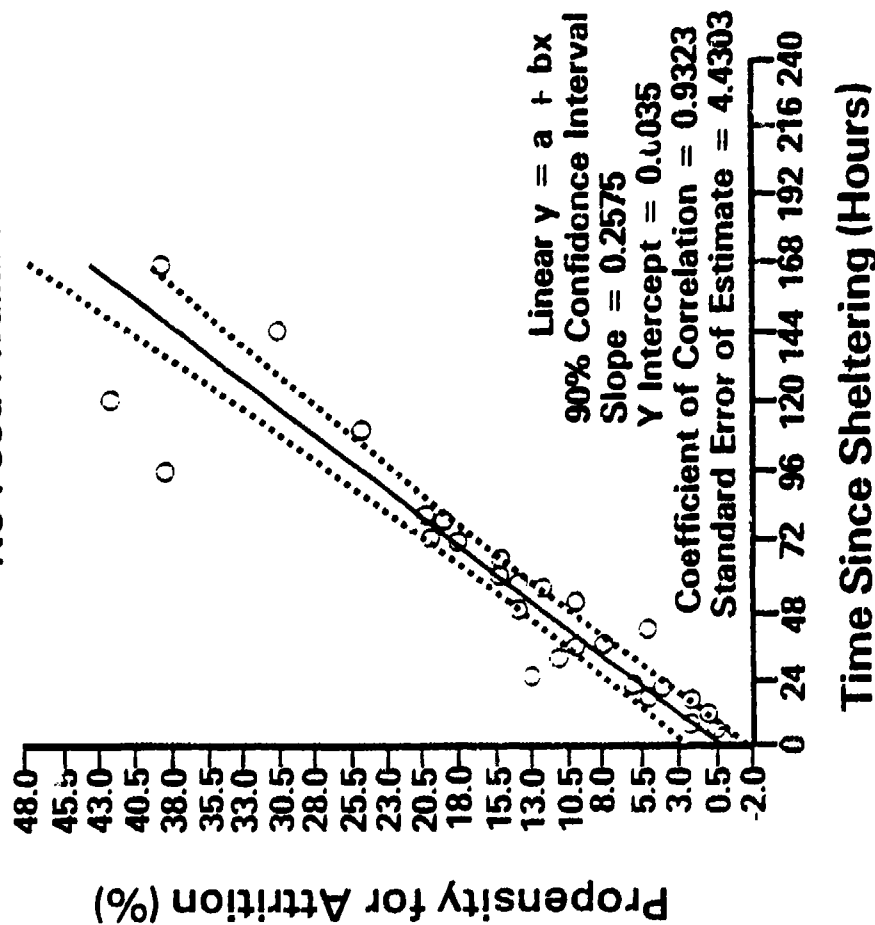


Time Since Sheltering (Hours)

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

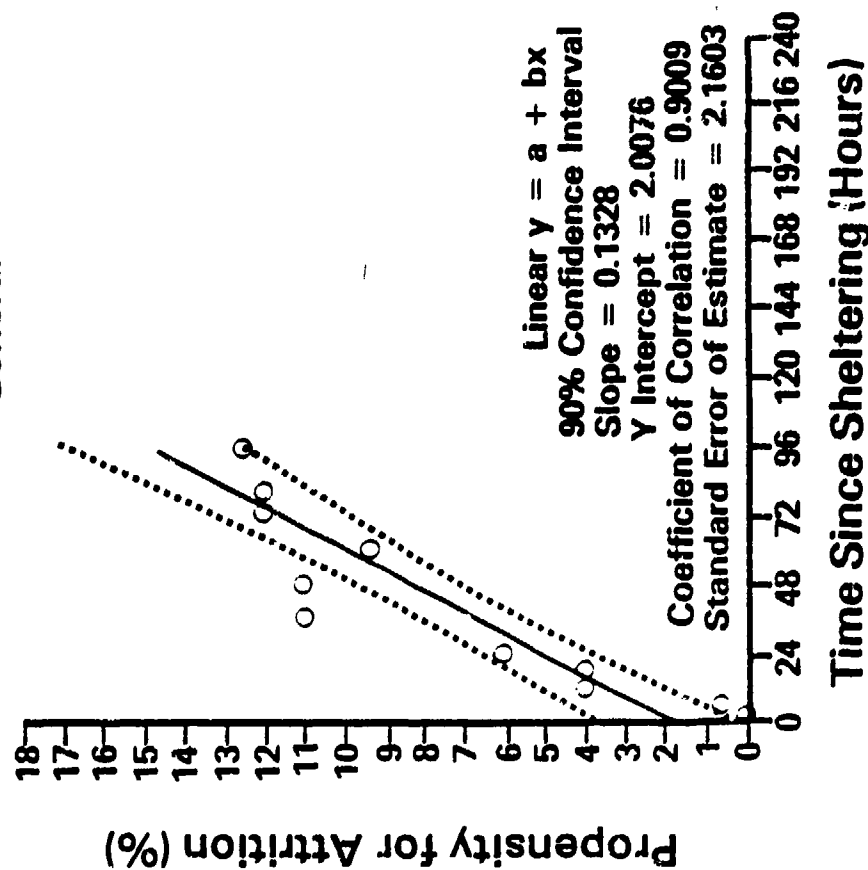
BASIC PHYSIOLOGICAL	TIME (HOURS)	PROPENSITY (%)
Food Availability	24	6.2
No Food Available	48	12.4
	72	18.5
	46	24.7
	120	31.0
	144	37.1
	168	43.3
	192	49.4
	216	55.6
	240	61.8



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

BASIC PHYSIOLOGICAL	TIME (HOURS)	PROPENSITY (%)
Water	24	5.2
General	48	8.4
	72	11.6
	96	14.8
	120	18.0
	144	21.2
	168	24.3
	192	27.5
	216	30.7
	240	33.9



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

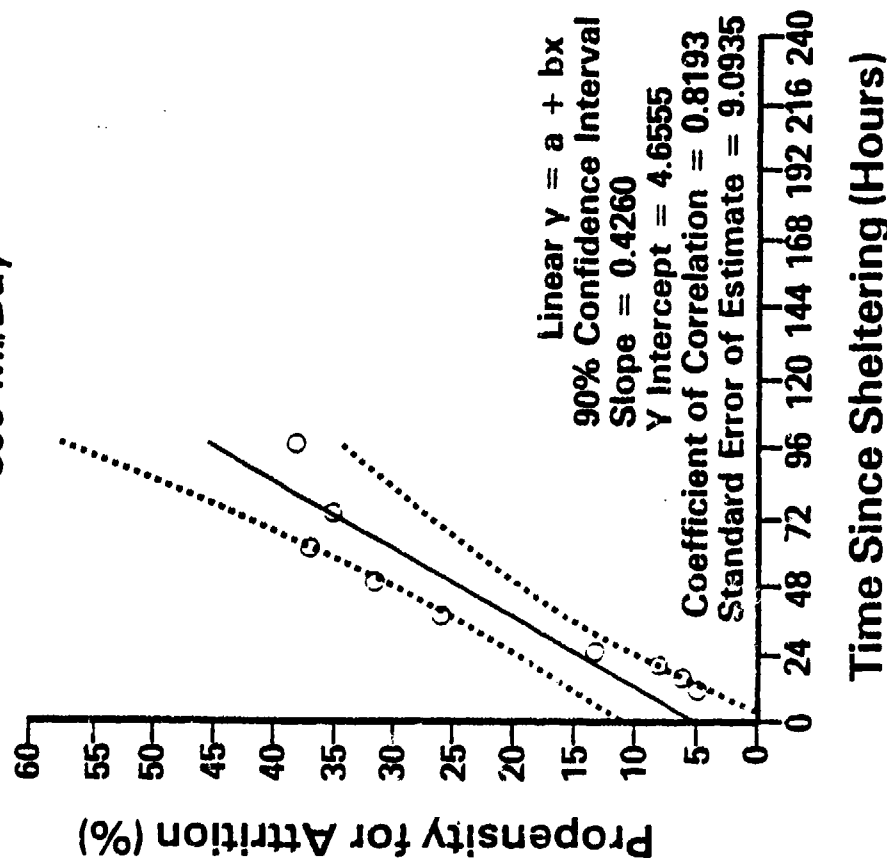
DATA

BASIC PHYSIOLOGICAL

Water
500 MI/Day

TIME
(HOURS)

PROPENSITY
(%)



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

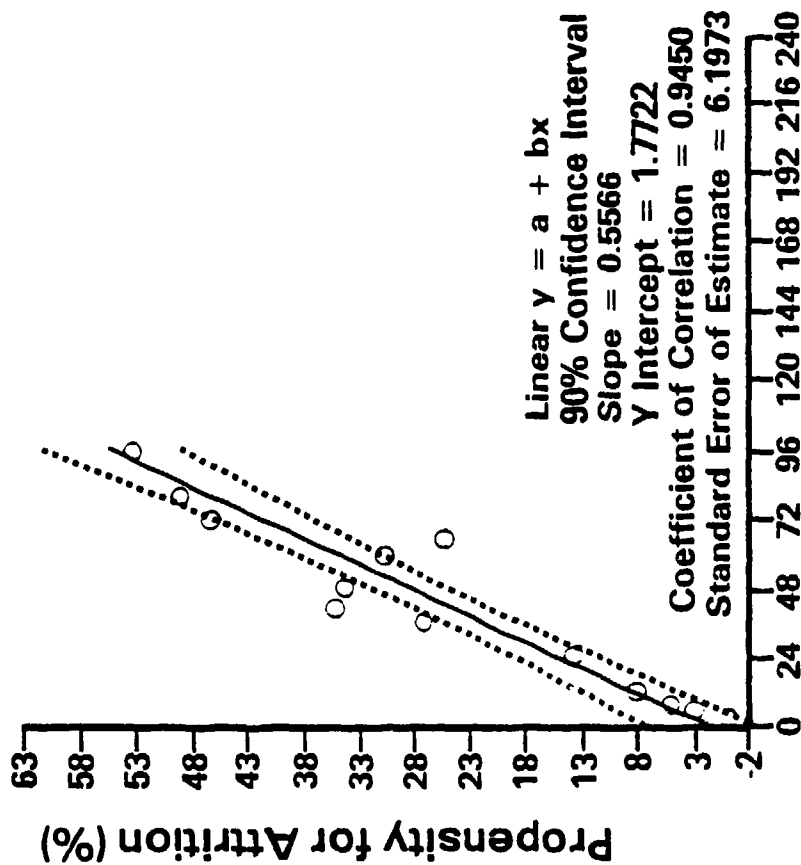
DATA

BASIC PHYSIOLOGICAL

Water
250 MI/Day

TIME
(HOURS)

PROPENSITY
(%)



Time Since Sheltering (Hours)

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

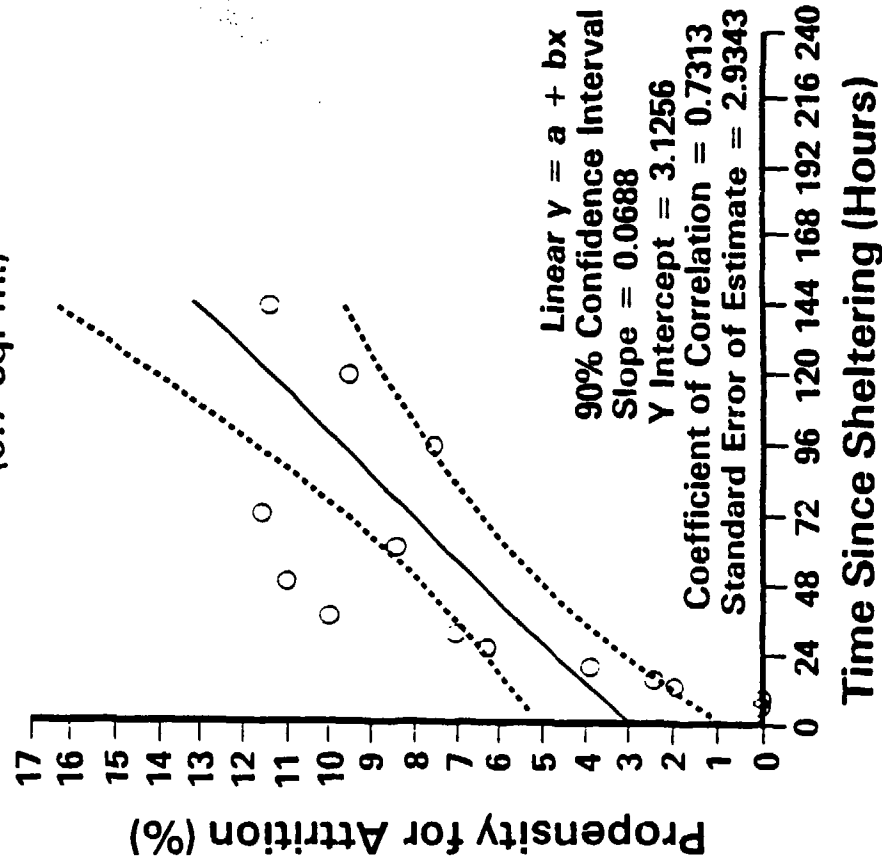
DATA

SHELTER SPACE

Greater Than 8 sq. ft.
(0.7 sq. m.)

TIME
(HOURS)

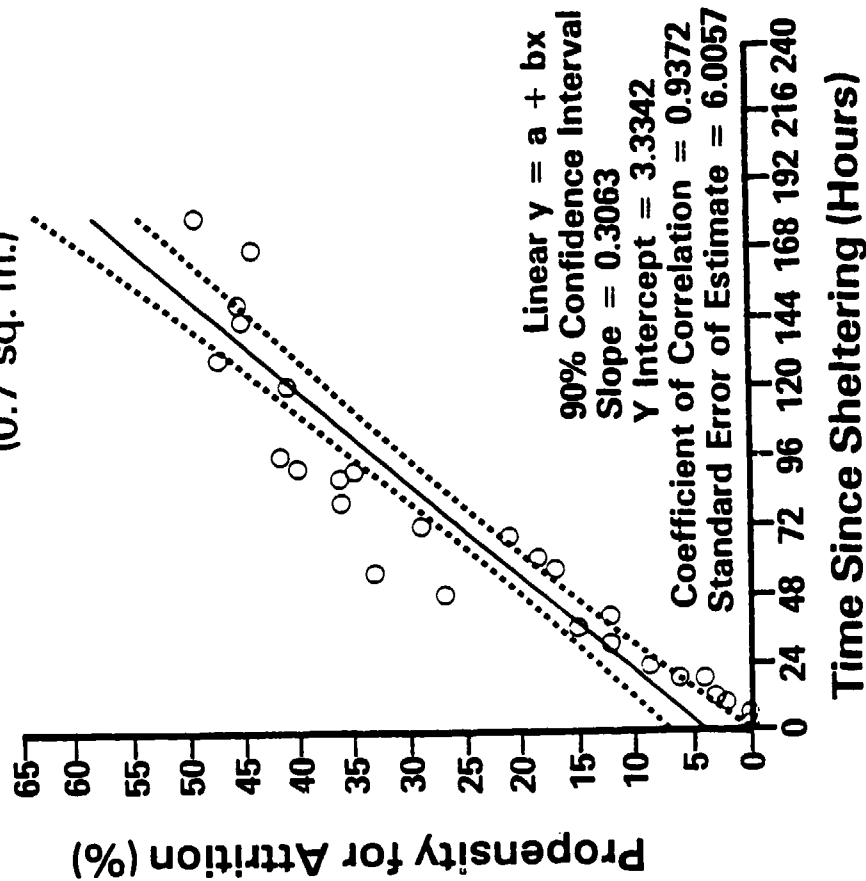
PROPENSITY
(%)



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

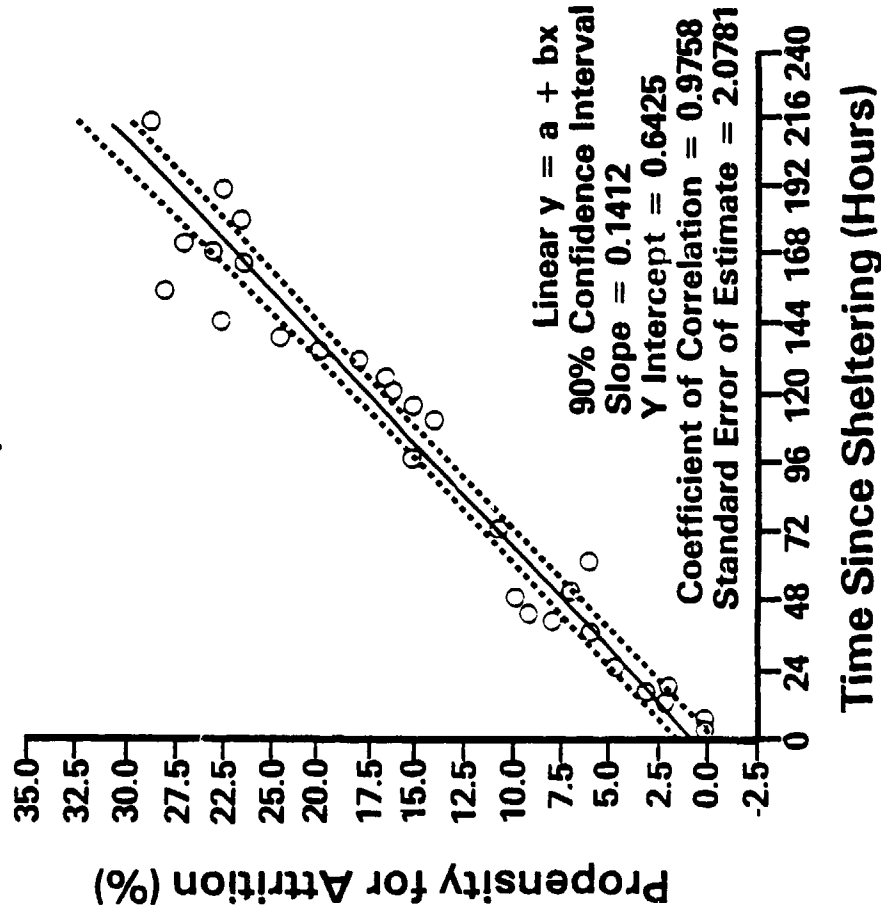
SHELTER SPACE Less than 8 sq. ft. (0.7 sq. m.)	TIME (HOURS)	PROPENSITY (%)
	24	10.7
	48	18.0
	72	25.4
	96	32.8
	120	40.1
	144	47.4
	168	54.8
	192	62.1
	216	69.5
	240	76.8



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

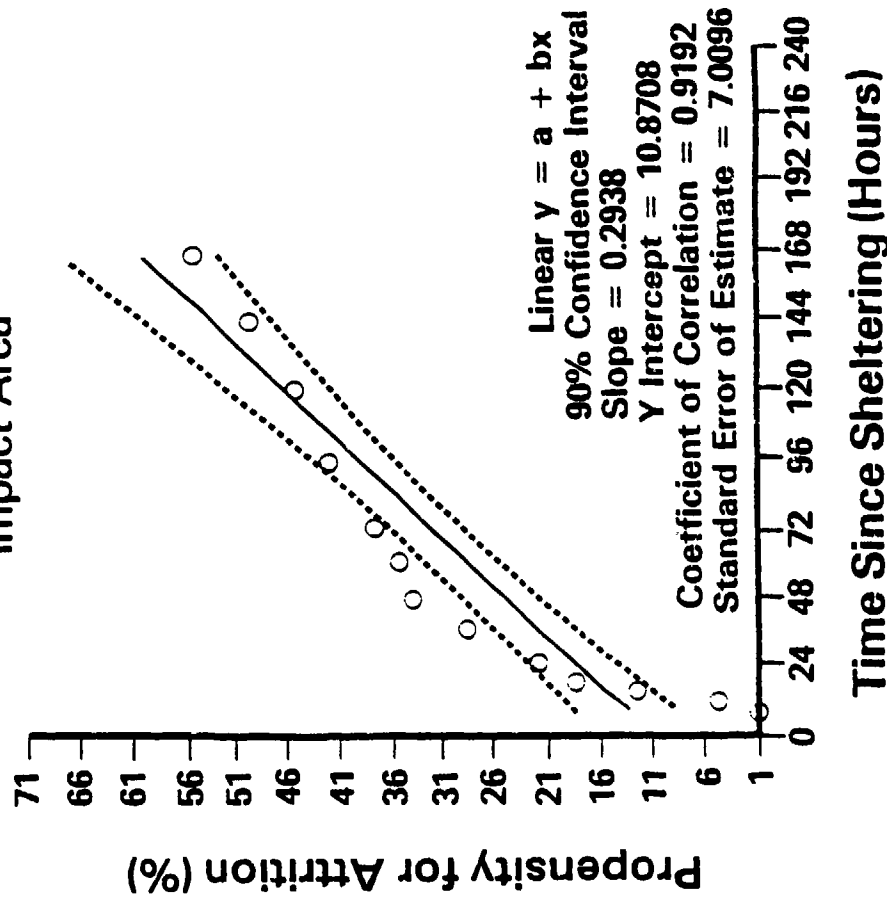
SHELTER TYPE	TIME (HOURS)	PROPENSITY (%)
Formal	24	4.0
Impact Area	48	7.4
	72	10.8
	96	14.2
	120	17.6
	144	21.0
	168	24.4
	192	27.8
	216	31.1
	240	34.5



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

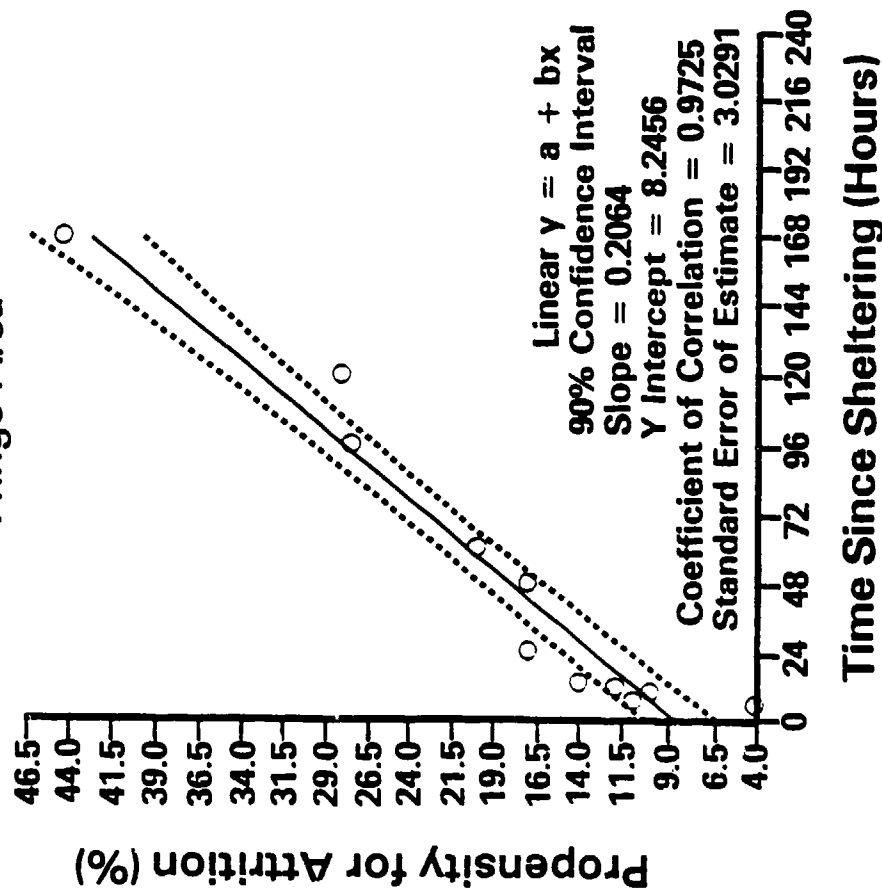
SHELTER TYPE	TIME (HOURS)	PROPENSITY (%)
Expedient Impact Area	24	17.9
	48	25.0
	72	32.0
	96	39.1
	120	46.1
	144	53.2
	168	60.2
	192	67.3
	216	74.3
	240	81.4



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

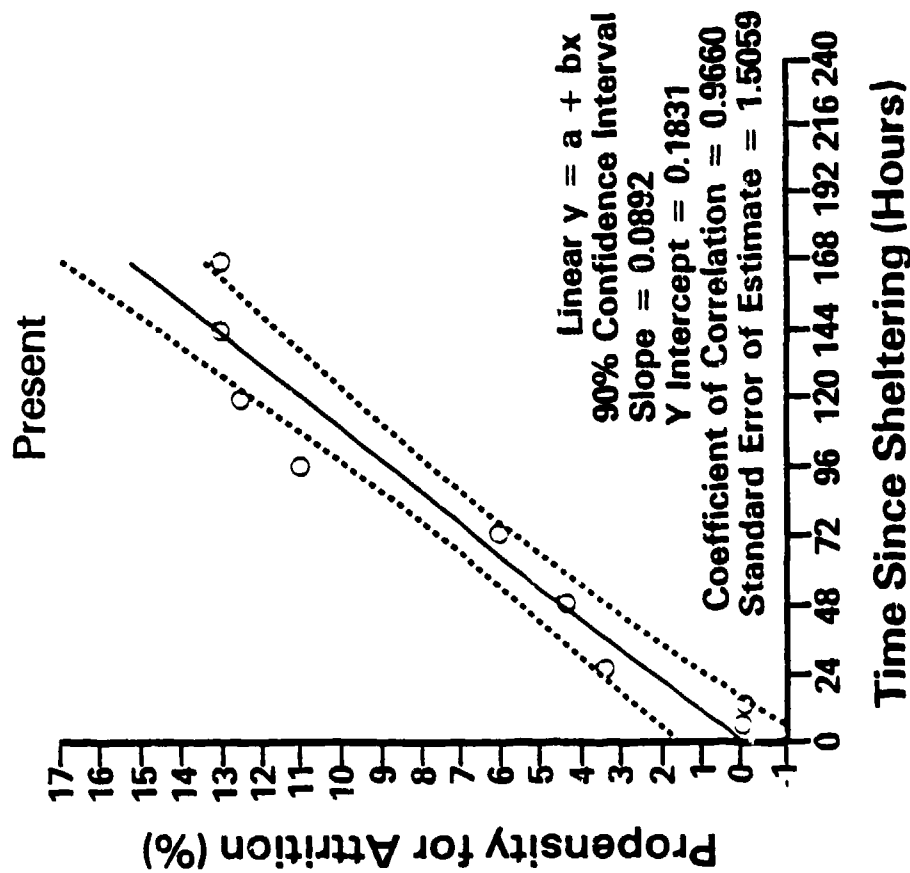
SHELTER TYPE	TIME (HOURS)	PROPENSITY (%)
Expedient Fringe Area	24	13.2
	48	18.2
	72	23.1
	96	28.1
	120	33.1
	144	38.0
	168	43.0
	192	48.0
	216	53.0
	240	58.0



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

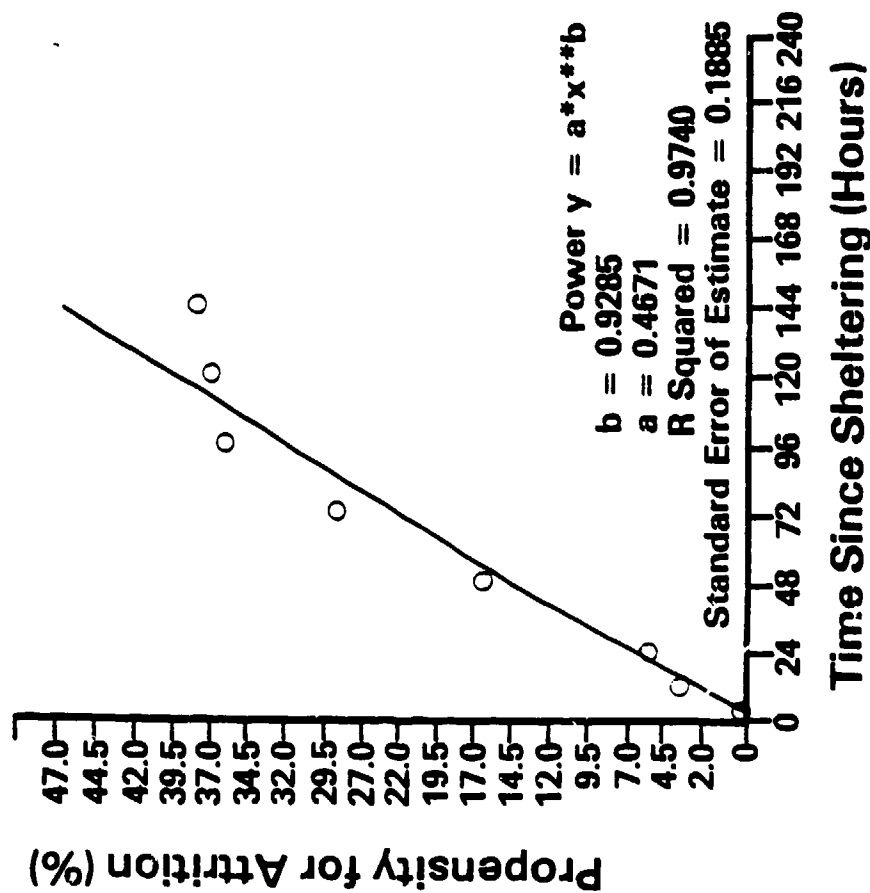
SHELTER MANAGEMENT	TIME (HOURS)	PROPENSITY (%)
Present	24	2.3
	48	4.5
	72	6.6
	96	8.7
	120	10.9
	144	13.0
	168	15.1
	192	17.3
	216	19.4
	240	21.6



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

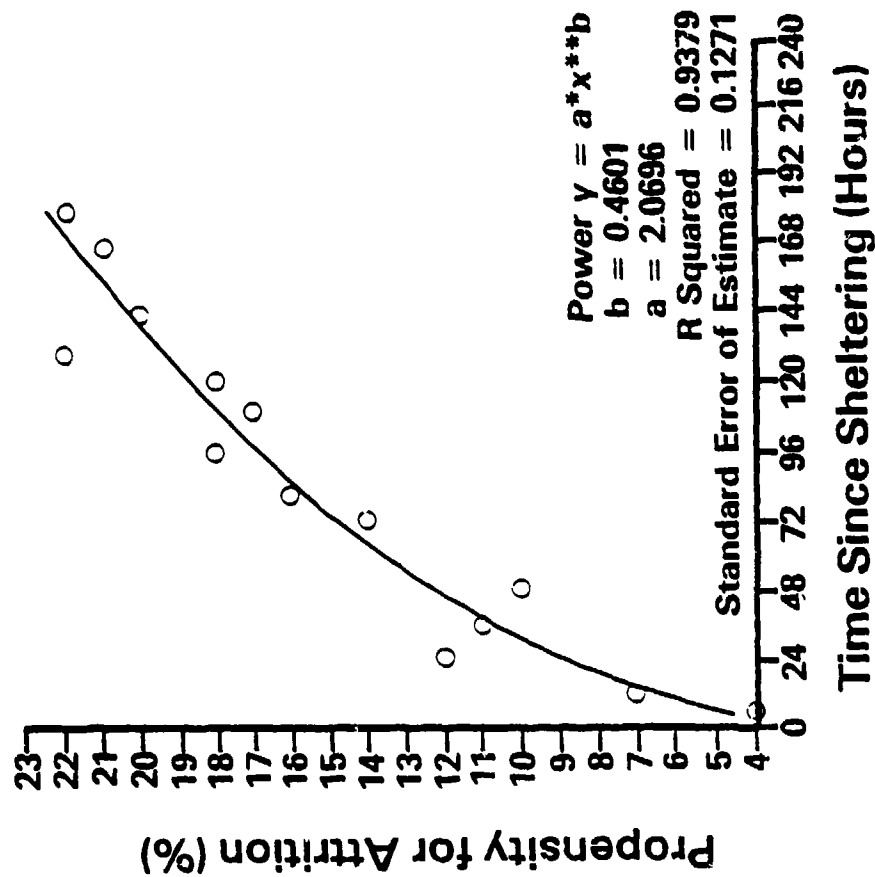
SHELTER MANAGEMENT	TIME (HOURS)	PROPENSITY (%)
None	24	9.0
	48	17.0
	72	24.8
	96	32.4
	120	40.0
	144	47.1
	168	54.4
	192	61.6
	216	68.7
	240	75.8



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

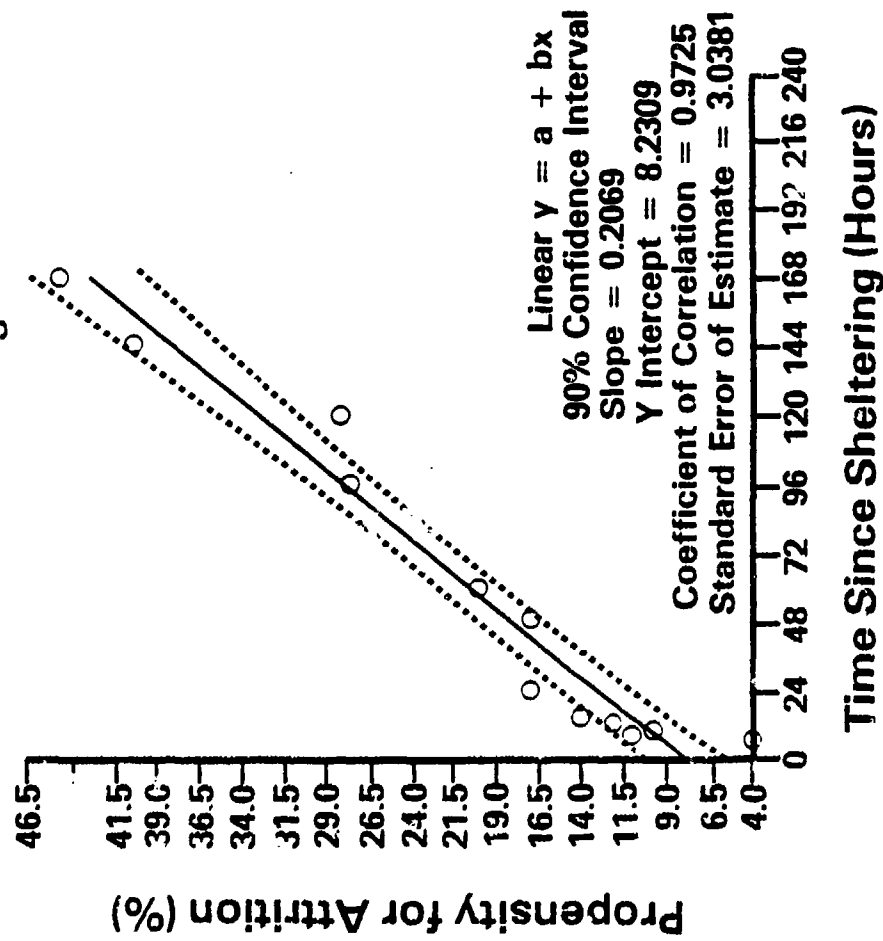
WARNING Warning	TIME (HOURS)	PROPENSITY (%)
	24	9.2
	48	11.4
	72	13.7
	96	15.9
	120	18.2
	144	20.4
	168	22.7
	192	24.9
	216	27.2
	240	29.4



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

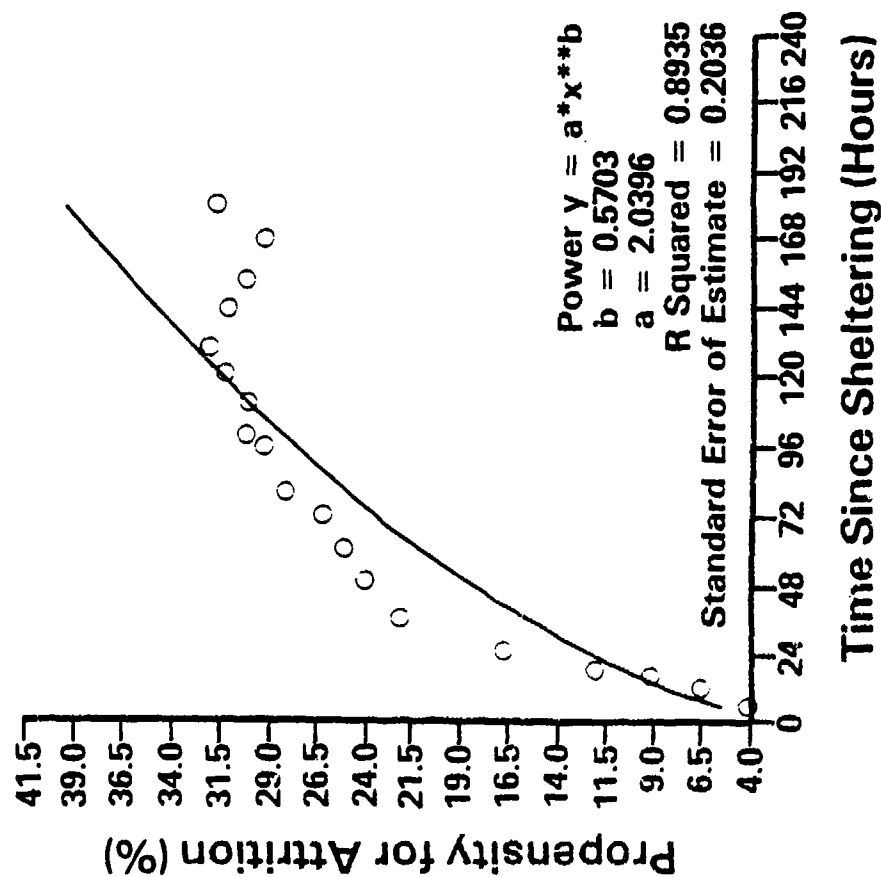
WARNING	TIME (HOURS)	PROPENSITY (%)
No Warning	24	13.2
	48	18.2
	72	23.1
	96	28.1
	120	33.1
	144	38.0
	168	43.0
	192	48.0
	216	53.0
	240	58.0



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

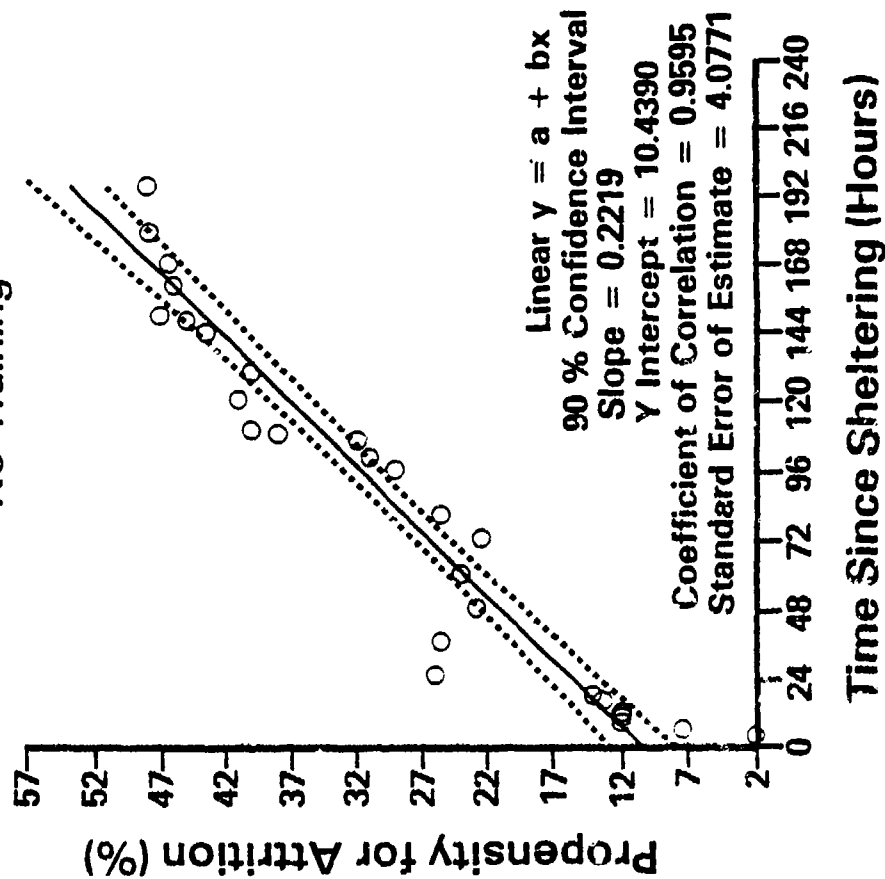
TRAINING Trained	TIME (HOURS)	PROPENSITY (%)
	24	15.3
	48	18.7
	72	22.0
	96	25.2
	120	28.7
	144	32.0
	168	35.4
	192	38.7
	216	42.1
	240	45.4



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

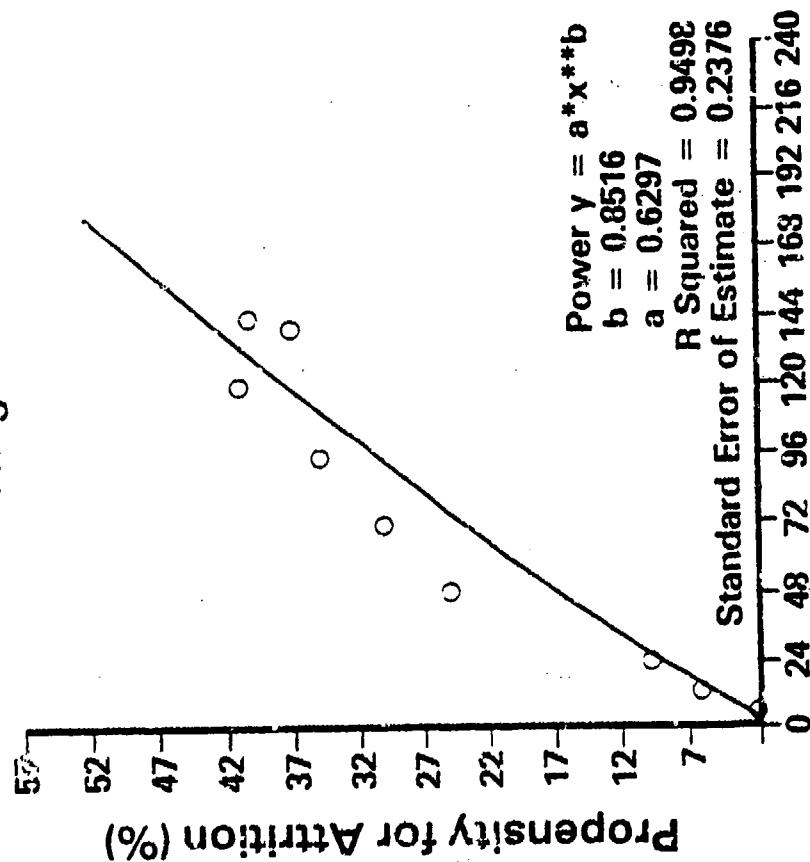
TRAINING	TIME (HOURS)	PROPENSITY (%)
No Training	24	15.7
	48	21.1
	72	26.4
	96	31.7
	120	37.1
	144	42.4
	168	47.7
	192	53.0
	216	58.4
	240	63.7



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

EVACUATION POSTURE	TIME (HOURS)	PROPENSITY (%)
Evacuated Fringe Area	24	13.0
	48	18.3
	72	23.6
	96	28.9
	120	34.2
	144	39.5
	168	44.8
	192	50.1
	216	55.4
	240	60.7



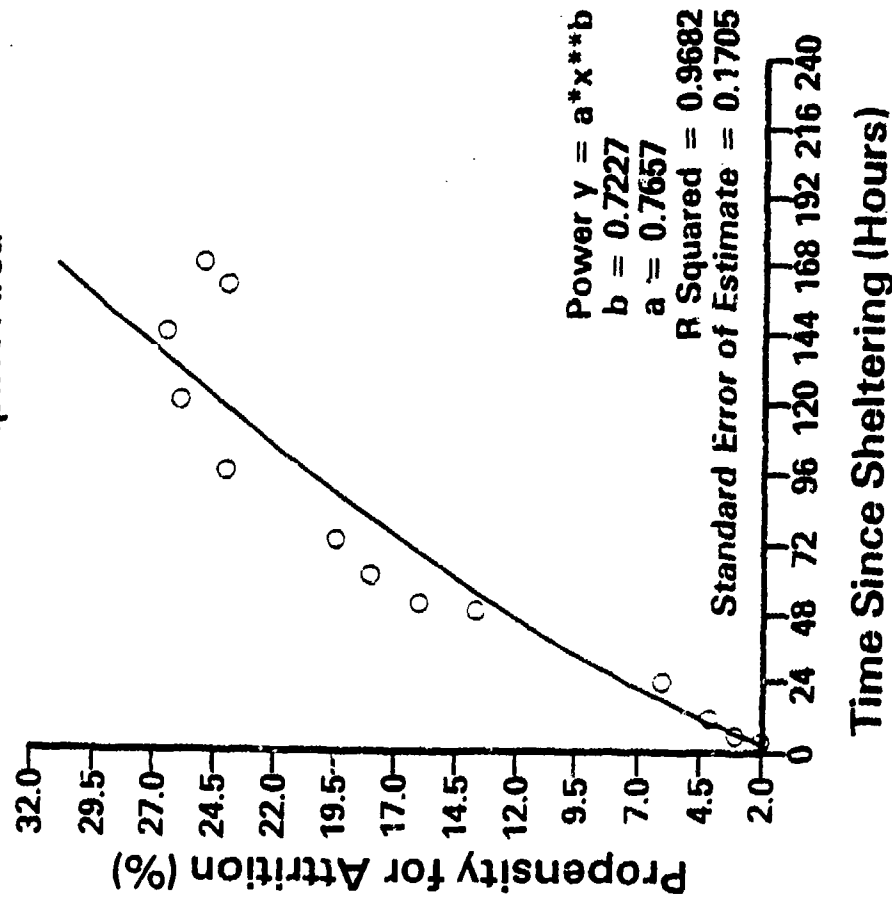
Time Since Sheltering (Hours)

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

EVACUATION POSTURE

Non-Evacuated
Impact Area

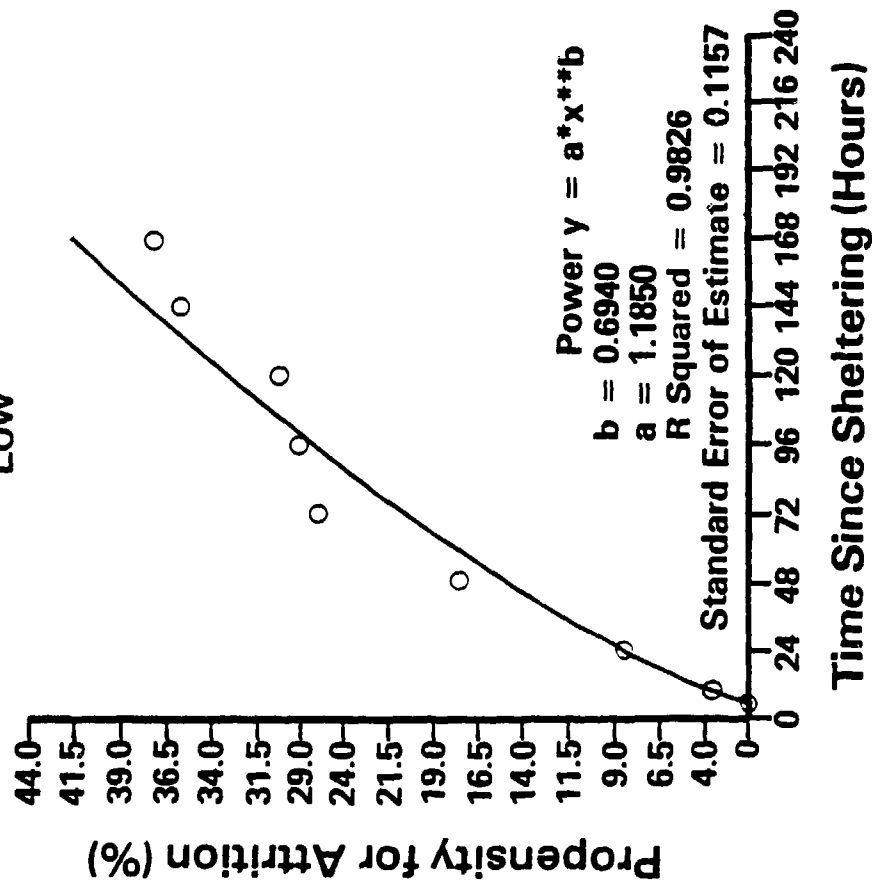


TIME (HOURS)	PROPENSITY (%)
24	8.6
48	12.1
72	15.6
96	19.1
120	22.7
144	26.2
168	29.8
192	33.3
216	36.8
240	40.4

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

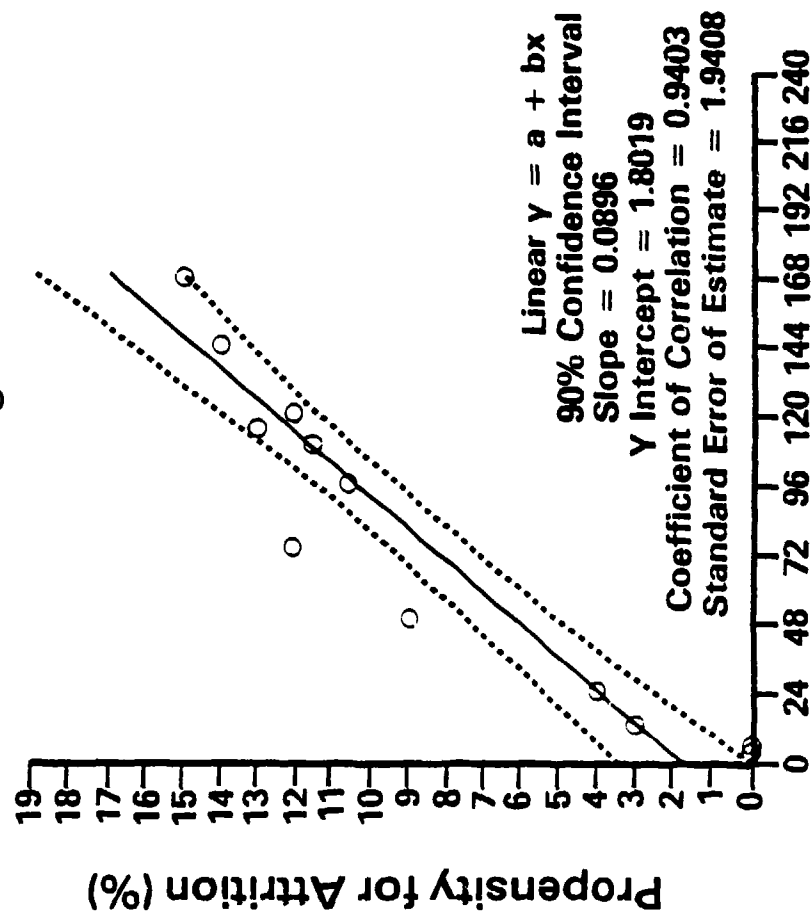
COMMUNICATION	TIME (HOURS)	PROPENSITY (%)
Present	24	10.1
Low	48	17.4
	72	23.1
	96	28.1
	120	32.9
	144	37.3
	168	41.5
	192	45.5
	216	49.4
	240	53.2



BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

COMMUNICATION	TIME (HOURS)	PROPENSITY (%)
Present High	24	4.0
	48	6.1
	72	8.3
	96	10.4
	120	12.6
	144	14.7
	168	16.9
	192	19.0
	216	21.2
	240	23.3

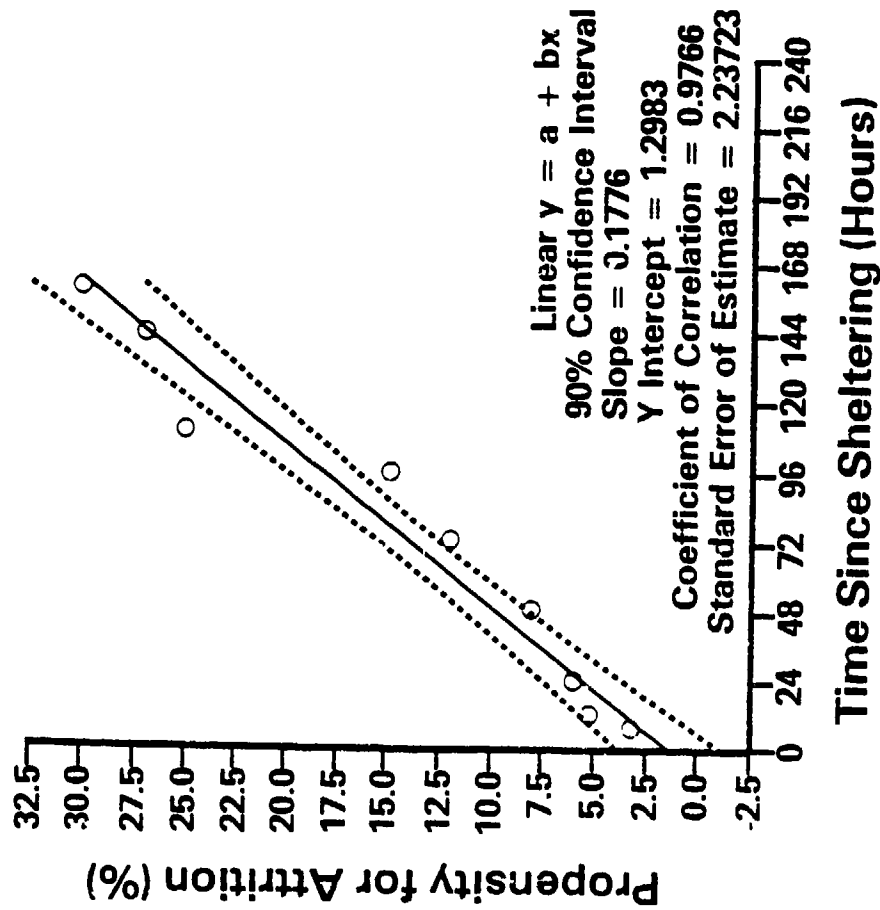


Time Since Sheltering (Hours)

BEHAVIORAL ASPECTS OF FALLOUT SHELTER STAY

DATA

COMMUNICATION	TIME (HOURS)	PROPENSITY (%)
Absent	24	5.6
	48	9.8
	72	14.1
	96	18.3
	120	22.6
	144	26.9
	168	31.1
	192	35.4
	216	39.7
	240	44.0



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